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Economic Affairs

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Economic Affairs

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ECONOMIC POLICY, ORGANIZATION, MANAGEMENT

Gospriyemka Adds Advisory, Operational Functions to Its Mandate

18200207 Moscow *EKONOMICHESKAYA GAZETA* in
Russian No 23, Jun 88 p 9

[Article by Yu. Burov and V. Katargin, senior representatives of Gospriyemka at Sibelektrotiyazhmash, Norilsk: "Don't Drown in the Current"]

[Text] It is impossible for gospriyemka to work only according to the principle of firefighters—to suppress them only where they are burning. The state controllers will achieve a tangible improvement in product quality in the case where they know how to deeply understand production problems and, the main thing, to find ways to resolve them.

Today there is no sense in returning to those passions which were simmering during the first months of the work of gospriyemka at Sibelektrotiyazhmash. We were forced, for example, to stop the acceptance of products seven times. We used economic sanctions three times and three of the shop chiefs had to make formal presentations to the administrative commission.

The first time, as it turned out, the workers of the association resented us, and we resented them. Perhaps they don't understand that we are striving for the good of the enterprise? But finally a common language was found, and rather quickly.

It was something else that turned out to be most difficult: not to "drown", not to squander our energy in the commotion of daily events. Many questions arose unexpectedly.

But to work all the time, just like at a fire, is impossible. No matter how one tries, there is just not enough time. We understood very quickly: it is necessary to find and eliminate the fundamental reasons for the manufacture of poor quality products.

We did not have to look long to find the main reason for the nonrhythmic nature of production. Earlier the enterprise had tried to struggle with this but without any noticeable success. Gradually the collective became resigned to this, having decided that the struggle was useless. But was this really the case?

Now, jointly with the enterprise, we have worked out a long-term program called "Rhythmicity." It includes improvement of the automatic control system [ASU], operational-production planning, material-technical guarantees and stimulation of labor.

Setting out to fulfill the regular order, the enterprise set up a work schedule calculated according to what they could manage in the dates set. For this the system of

planning for ensuring materials and components was almost completely reviewed, more exact dates for manufacturing parts were determined. Unfortunately, there are reasons for non-rhythmic work which do not depend on us. One of these is unreliable material-technical supply. However, competent planning, timely fulfillment of calculations using the automatic control system and decreasing the transshipment of parts from shop to shop—all this can and should be organized by specialists of the association and there are no "objective" reasons or hindrances here. The program is aimed at developing the collective's initiative and those measures which they can implement themselves are indicated in it.

In particular, for speeding up the process of assembling parts they decided to create specialized shops and sections: when machines move from shop to shop, so much time is lost!

It was decided to calculate the plan-schedule of the brigade for basic construction by using a computer. The system calculates the bonus payments to the brigade and their rhythmic fulfillment of tasks.

It is particularly pleasant to feel that our work is already producing evident changes. For example, signals came from the consumers that some of the machines had increased vibrations. Formally this had nothing to do with us or with the manufacturers; everything had been done according to the standards. But this does not make it easier for the customer. So we suggested that we make the standard for the level of vibration stricter than those of the state standards. We thought, however, that the producers would not agree.

But they supported us immediately. In April of last year there was a comprehensive program for improving the vibration of electrical machines. By the end of this year it should be realized in full, just as it had been planned from the beginning. They have already been successful in noticeably improving the vibration of the rotors.

Now and then it was heard that gospriyemka, because of the great number of new tests, had given birth to additional paperwork. But it is not difficult to rid oneself of this—one only has to think of how to do it. For example, we agreed with the services of the Department of Technical Control [OTK] and the association's specialists to replace the forms for notification of claims with a single entry into a special journal. Both sides got rid of 1,500 pages of paper flow in a month.

The large number of different types of tests was always associated with the production of electrical machines. This required significant material expenditures and time. The introduction of gospriyemka also meant the introduction of additional tests, even though part of them were identical to those conducted by the OTK. Was this efficient? The leadership of the association supported our suggestion to combine the identical tests

without sacrificing quality, of course. Thus we were successful in economizing not only time but also energy resources worth 54,000 rubles a year.

It is possible to point out in the examples we have cited that *gospriyemka* is fulfilling functions unusual for it. We also had such conversations in the beginning. But now these are not heard. Life has proved the correctness of our position. Only last year the State Mark of Quality was awarded to 84 percent of the hydro and turbogenerators, large high-capacity electrical machines, high frequency generators and other products manufactured by the association. And don't think us immodest, but in these successes a share of the work belongs to the workers of *gospriyemka*.

INVESTMENT, PRICES, BUDGET, FINANCE

Enterprise Law Commentary Highlights Gosbank Credit Role

18200151 Moscow KHOZYAYSTVO I PRAVO in
Russian 1 No 3, Mar 88 (signed to press
9 Mar 88) pp 9-17

[Article by M. Kogan, deputy chief, Credit and Payment Relations Methodology Administration, and chief, Law Division, USSR Gosbank [State Bank]: "Credit and Payments (A Commentary on Article 18 of the Enterprise Law)"]

[Text] The USSR Law on State Enterprises (Associations) (hereinafter designated as "the Law") is strengthening the foundations of enterprises' (hereinafter the word "enterprises" shall be taken to mean enterprises and associations) credit and settlement-payment relations under the conditions of full cost accounting and self-financing.

Enterprises' Credit Relations with Banks

An important role in implementing those points of the Law which regulate the enterprises' credit relations with banks is played by the normative acts of the USSR Gosbank. The USSR legislation has granted the USSR Gosbank, as the country's main bank, the right to specify, in conjunction with specialized banks on an integrated methodological basis, the composition of projects to be granted extended credits, along with the conditions for the issuance and repayment of credits, privileges in extending credits, measures for credit influences on loan recipients and the conditions of their utilization, as well as, upon agreement with USSR Gosplan and the USSR Ministry of Finance—the interest rates for the use of credits. One of the fundamental normative acts regulating enterprises' relations with regard to extending credit under the new economic conditions consists of the Rules, as approved by the USSR Gosbank on 30 October 1987, for extending credit for material reserves and production outlays.

An enterprise can utilize bank credit for production and social purposes under the conditions of strictly observing **credit extension**. This consists, in the first place, of **securing loans by commodity-and-physical assets**. The economic organization which has obtained a loan must have available those physical assets as a collateral on which the loan was granted, or it must produce the outlays credited by the bank. This principle guarantees a direct link between credit and the movement of physical assets. Loans with commodity-and-physical assets as collateral are secured by pledging these assets as security or by so pledging the products as they are produced. Another method of securing a credit obligation is a guarantee from the borrower's higher-ranking organ.

In the second place, the **targeted nature of credit** must be utilized solely for the designated purpose. For example, a loan granted for working capital cannot be used for capital investments. Violation of these requirements will entail the application of sanctions, right up to the premature abrogation of loans and cutting off further extension of credit.

In the third place, the **reimbursability of credit**.

In the fourth place, **setting a time limit on credit**. Loans are subject to repayment by a fixed deadline in accordance with the obligations accepted by the borrowers.

And, finally, the **principle of paying for credit**. The differentiation of interest rates on credits has now been expanded, depending upon the purposes for which they are to be utilized: for plan, above-plan, or for unforeseen needs. The size of the interest rates also depends upon the timeliness of returning the credit. Banking-institution managers in the localities have been accorded the right—within the bounds of the established interest-rate scales—to lower or raise them, depending upon the enterprises' observance of the plan amounts of reserves of commodity-physical assets, accelerating the turnover and preservation of working capital and fulfilling the obligations to the banks with regard to repayment of credits. The stimulating role of interest rates for credit is also facilitated by the fact that they are paid for from the enterprise's profits or revenues first. Enterprises utilizing the form of cost accounting based on the normative method of distributing profits pay out interest on the credit before proceeding to distribute its residual portion to the labor collective. Enterprises in which cost accounting is based on the normative distribution of revenues pay interest on the credit before forming the cost-accounting income of the collective.

An enterprise can make use of short-term as well as long-term credit in the banks. In accordance with the Law (Par. 1, Art. 18), short-term credit is issued by a bank to an enterprise for the purpose of current activity with regard to consolidated projects for the extension of credit. It is one of the sources whereby enterprises may

form working capital. Such credit is granted for time periods extending beyond the course of fulfilling production plans and selling the goods but, as a rule, not for more than 12 months.

Long-term credit is granted for capital investments for a time period exceeding 12 months and is repaid by money from the fund for the development of production, science, and technology, as well as from the fund for social development or other funds for analogous purposes (for example, in trade enterprises—from the fund for production and social development).

Under the new conditions credit will be issued for consolidated projects requiring an extension of credit. This significantly expands an enterprise's rights; it allows the enterprise in question, by taking into account the needs arising in the course of carrying out the plan assignments, to switch around the borrowed money within the bounds of the total amount of credit. Such a project, for example, for enterprises in the fields of industry, transportation, communications, the local economy, everyday services, and procurement is an aggregate of material reserves and production outlays. Within such a project the following items are to be credited: reserves and outlays included in the normative working capital, goods which have been shipped out whose payment deadline has not yet fallen due, outlays for issuing advances for settling payments with the public, proposing letters of credit, and, purchasing checkbooks for settling payments for physical assets and services to be credited.

For a time period of up to 12 months each enterprise has established for it a plan amount of credit within the limits of which it can obtain bank loans. This plan amount is specified by the banking institution in conjunction with the enterprise, based on a study of the need to accumulate material reserves and taking into consideration the necessity of accelerating their turnover, handling production expenditures by proceeding from production volumes and product sales, freight turnover, goods turnover, procurement of agricultural products, and other assignments. Credits are granted as the actual reserves of goods and physical assets are accumulated and as the production expenditures increase. Moreover, consideration is also given to the observance by the enterprise of estimated-finance and credit discipline, the justification for the growth in reserves of goods and physical assets, and the implementation of measures for economizing on resources.

Banks do not extend credit for physical assets whose formation is connected with shortcomings in the enterprise's work. This pertains particularly to the following:

—above-normative remnants of finished goods, except for seasonal remnants or remnants which have formed in connection with holding back on shipping goods because of transportation difficulties or a stoppage of shipping to unpunctual payers;

—goods and physical assets which have been left (or produced) in excess of the year's production requirements, which have been stored without movement for more than a year, or other periods established for credit extension, as well as surplus and unusable material resources;

—goods and physical assets whose storage conditions do not meet the GOST [All-Union State Standard] or the engineering specifications, sectorial, departmental, and interdepartmental instructions.

A banking institution has the right to grant credits within the limits of the resources allocated to it according to the credit plan. With the introduction of credit extension for a consolidated project, the normative acts regulating the issuance of loans for specific projects become invalid, in particular, payment credit, for payment documents en route, etc.

In connection with the fact that the Law prohibits the issuance of new loans to an enterprise if the latter is regularly overdue in repaying its debts on loans, the legal norms providing for loans to be granted regardless of the status of enterprises' accounts with the bank.

Under the new conditions credit extension for enterprises' material reserves and production outlays will be carried out through individual loan accounts. In connection with this, a halt has been called to extending credit to enterprises for turnover of goods and physical assets and expenditures on wages from special loan accounts, which previously was predominantly in the non-seasonal sectors of industry.

The issuance of loans is carried out by means of paying monetary-payment documents, as well as by paid reserves and outlays, channeling money into repaying overdue indebtedness on loans obtained earlier and in the remaining portion—into the enterprise's payment account.

There has been an expansion of enterprises' rights in determining the time periods and the procedure for repaying a loan. Paying up indebtedness on loans is done within the time periods provided for by the bank's credit agreement with the enterprise in question. This repayment on a credit extension for an aggregate of reserves and outlays can be carried out with the enterprise's consent by means of contributing to the loan account the free remnant of monetary funds which have been left on the day repayment was made in the payment settlement account after the payments have been made. If such consent has not been obtained, or if there are other claims against the enterprise's account, the bank has the right to penalize indebtedness on loans when the time period for their repayment has expired in an undisputed procedure from the payment account in a calendar cycle of regular payments.

Penalties can also be extracted on loans in case a payment is overdue, or there arises a premature, systematic indebtedness, and in other cases where there are violations of the established rules of credit extension.

The legal form of credit relations between an enterprise and a bank is now substantially changing. The credit agreement concluded between them is now becoming such a form. It defines the bank's rights and obligations as well as those of the specific borrower, taking into consideration the credit to be granted and the financial-economic status of the enterprise, the economic responsibility of the parties involved for violations of the obligations accepted. A credit agreement is concluded for a year or for a longer period of time. The contents of such an agreement are determined by the parties acting on their own. The following factors should be provided for: the plan scale of credit, time periods and other conditions for issuing and repaying loans, securing the credit obligation in the form of putting up goods and physical assets as collateral, interest rates, the scale of its own working capital, and covering material reserves and expenditures, lists of payments and data necessary for extending credit, time periods of their preparation by the enterprise, and the economic indicators to obtain which the enterprise has been formed as the result of utilizing credit.

All questions connected with the extension of credit are now decided by the enterprise in the credit institutions at the place where the payment account or the account for financing the capital investments has been opened. This allowing the operational effectiveness of credit extension to be enhanced, makes it possible for the banking institutions to make a more profound study of the financial situation of the enterprises to which credit is being extended, and to facilitate with all measures the development of their initiative and management enterprise without allowing petty interference in their operational activity.

In concluding and extending credit agreements, a banking institution acts in the name of its respective bank as a person before the law, bearing responsibility for the obligations stemming from these agreements. In case disputes arise, the actions of the banking institution can be appealed by the enterprise right up to the board of the bank in question.

There has been an expansion in the role played by long-term credit for the purpose of production and social development. Thus, specialized banks can grant to enterprises in all sectors of the national economy long-term credit for capital outlays connected with promulgating measures to accelerate scientific and technical progress, increase production, improve the quality and broaden the assortment of goods and paid services for the population, as well as to expand the export base. Projects to which credit can be extended include the following: an enterprise's outlays for retooling, construction, proportional participation in creating joint enterprises and

production lines, expenditures for organizing and broadening the material and technical base of auxiliary farms. Long-term credit extension is carried out on the basis of credit agreements with regard to each measure. The time period for such credit is determined by proceeding from the normative time period for implementing the measure in question and its payback plan. As a rule, the time period must not exceed six years. The scale of the credit is determined by proceeding from the complete cost estimate of the measure involved. Repaying the credit is accomplished by means of money from the fund for the development of production, science, and technology, from the fund for social development, other analogous funds, and, in cases provided for by the legislation, also by means of 50 percent of the turnover tax from selling these consumer goods produced by means of the measure for which credit is extended.

For the first time legislation has provided that the USSR's banks can issue, along with credits for specific measures, long-term credit for organizing the output of a new product through a complete cycle—from scientific-research developments and the creation of experimental models to its serial production. In this case banks extend credit for an enterprise's expenditures for conducting scientific research, experimental design, planning, and test-engineering operations, for making and testing experimental models, renovation, expansion, and retooling, for installing and fine-tuning equipment, making regulation batches, as well as for preparing and conducting product certification. Credit extension is carried out on the basis of a credit agreement. The latter is concluded on the basis of an enterprise's agreements concluded with the scientific-research, design, construction, installation, and other organizations taking part in developing and preparing production, and turning out the new item, as well as plans for scientific and technical progress. Credit is granted from a separate loan account for a time period of up to three years with repayment by means of money from the fund for the development of production, science, and technology.

In cases of low economic effectiveness in the plans for the retooling, renovation, and expansion of existing production lines, USSR banks have been accorded the right to demand that ministries and departments conduct a state expert appraisal of the most important plan solutions. If the expert appraisal reveals plans which do not measure up to the latest achievements of science and technology, the banks can put a stop to their credit extension until progressive solutions are introduced into the plans.

There has been an increase in the role played by credit in enterprises' foreign economic activity. Banking institutions grant credit to enterprises which have obtained the right to conduct export and import operations directly, for export and import items within the USSR and abroad, services rendered, securities, and other payment documents relating to export and import operations, as well as for expenditures involved in conducting foreign economic activity.

In order to create and develop export production lines, the Vneshekonombank [Foreign Economic Bank] can grant credits to enterprises in foreign currency for a time period of up to eight years, with repayment of the loans to be made by means of currency earned from product exports.

The enterprise bears the responsibility for the effective utilization of bank credit. It must not use such credit for the purpose of covering prolonged financial gaps, mismanagement, or losses. Banking institutions have the right to check up on the material security of loans issued with goods and physical assets as collateral and on production outlays. Under the new conditions checkups on securities are conducted, for the most part, on the basis of analyzing enterprises' balance sheets for quarterly periods and information based on the data from the bookkeeping accounts. The reasons for the formation of indebtedness on loans are ascertained by the bank with the participation of the enterprise involved. Moreover, specific measures are worked out to prevent such indebtedness from occurring in the future.

Banking institutions employ a varied system for extending credit, depending upon an enterprise's performance of its obligations. They can set up a privileged system of credit extension for enterprises which do not have above-normative reserves of goods and physical assets and an overdue indebtedness on loans. In such cases there is no suspension of payment of settlement documents by means of loans, when and if the plan amount of credits is exhausted.

If an enterprise violates the conditions under which credit has been extended, the bank can employ sanctions against it—measures affecting its credit. In deciding the question of whether to employ credit sanctions and their nature, a banking institution considers in each specific case the implementation by the enterprise of actual measures to improve its operation and financial status, as well as its future prospects, and the degree to which it has fulfilled its contractual-agreement obligations to the bank. The bank has the right to cut short its credit extension completely or partially, to impose penalties on loans ahead of time in cases of an unsecured indebtedness, the use of money issued for purposes other than those designated, or a violation of the established rules for credit extension, the sale or expenditure of collateral securities without turning over the amounts received for paying back its indebtedness to the bank, the unsatisfactory retention of goods and physical assets which constitute collateral to secure the bank's loan, as well as avoiding banking controls.

In case of a systematic violation of the time periods for repaying loans, an enterprise loses the right to obtain new credit and only in certain cases can use it when guaranteed by a higher-ranking organ. The same procedure can be followed in granting loans to enterprises which do not retain their own working capital and which allow such working capital to be diverted into non-plan

goals. If an enterprise has an overdue indebtedness on a loan by more than 30 days, and it cannot liquidate this indebtedness because of a lack of money, the bank can cut off the flow of credit and has the right, at its own discretion, to market (sell) the collateral goods and physical assets in order to pay back the indebtedness on the loans in question. If the loan was issued subject to the guarantee of a higher-ranking organization, then, if the money to repay it is lacking in the enterprise's payment account, the indebtedness on it shall be subtracted in an undisputed procedure from the guarantor's account. Enterprises which have completely lost their working capital shall not be granted credit by the bank, and loans issued previously shall be presented for collection ahead of schedule.

Enterprises which are operating badly (those operating at a loss, regularly failing to make their payments to the budget, to the bank, and to their suppliers) can be declared insolvent by the specialized banking institutions which serve them. And this can be made known to the enterprise's principal suppliers as well as to its higher-ranking organ. Announcements concerning the declaration of enterprises' insolvency shall be published in the press. Moreover, the credits previously issued shall be presented for collection ahead of schedule, and the issuance of new loans shall be cut off. The sequence in the order of payments to be made on the obligations of such enterprises shall be determined by the manager of the banking institution. The bank has the right (after satisfying the absolutely necessary needs) to channel the earnings coming in from product sales directly into paying back the overdue indebtedness on its loans in accordance with the bank's collateral rights. The enterprise and its higher-ranking organ are obligated to take the necessary measures to eliminate mismanagement and to strengthen payment discipline.

Restoration of credit extension to an enterprise which had previously been declared insolvent is done by the manager of the banking institution involved as the operating indicators and financial status improve. Suppliers which had previously been informed about the application of sanctions are also to be informed when and if such sanctions are lifted.

In cases of necessity, the USSR banks, in conjunction with the USSR Ministry of Finance, shall introduce to the USSR ministries and departments and to the Councils of Ministers of the union republics proposals concerning the liquidation or reorganization, following the established procedure, of enterprises which have been declared insolvent.

Enterprises' Payment Relations

The Law (Par. 2, Art. 18) establishes an enterprise's obligation to pay up its debts on schedule. For failing to make its payments on schedule, an enterprise pays fines and forfeits.

Payment operations are regulated by the Rules for Non-Cash Transactions in the National Economy, as approved by the USSR Gosbank on 30 September 1987. These Rules have replaced USSR Gosbank Instruction No. 2, which became invalid on 1 January 1988.

In order to maintain monetary assets and conduct payment transactions, a bank is obligated to open a payment account for an enterprise which operates on the principle of cost accounting, which has been allocated its own operating capital, and which has its own balance sheet. This is the enterprise's basic account, from which it makes payments on its own obligations.

Enterprises independently dispose of the monetary assets which are kept in their various bank accounts in accordance with their designated purposes. Under the conditions of full cost accounting and self-financing there has been a sharp increase in the role played by payment accounts. All the earnings derived by an enterprise from product sales are deposited in these accounts, whereas, in accordance with the turnover crediting procedure which was previously in effect, a considerable portion of such earnings was channeled directly into special loan accounts, thus by-passing the payment account.

In addition to payment accounts, those enterprises which have separate, non-cost-accounting units outside their main location have been granted the right to have subsidiary payment accounts; these may be opened in the enterprise's name in banking institutions in the place where these units are located. The basic purpose of a subsidiary payment account is to accumulate the non-cost-accounting unit's incoming earnings for subsequent transfer to the enterprise's main payment account. Of broader importance are the subsidiary payment accounts being opened by production associations at places where out-of-town structural units are located. These accounts are used to settle transactions between production associations and suppliers and purchasers. Acceptance of payment demands presented for payment from a subsidiary payment account is handled in the established procedure by the structural units in the association's name. Likewise deposited in these accounts are payments from purchasers received for physical assets shipped out by the structural units in the association's name, as well as for services rendered.

Current accounts can be opened in a banking institution directly for associations' structural units, enterprises' production lines, shops, and sections located outside their basic location. In connection with the increased importance of associations' structural units in economic activity and the expansion of their independence in accordance with the Law, USSR Gosbank, upon being requested by the association concerned, has permitted those structural units which have separate balance sheets to open payment accounts rather than current accounts.

If an association includes independent enterprises, they are permitted to open payment accounts in banking institutions on general principles.

In order for legal relations to evolve connected with opening a payment or a current account, certain legal facts must be present in their aggregate. These comprise the submission of an application to open the account, presentation of a document concerning the establishment of the enterprise or organization concerned, copies of the properly approved charter (statute), and cards with examples of the required signatures, stamps, and seals.

An application to open an account is presented in the enterprise's name; it is signed by the manager and the chief (senior) bookkeeper, and it is authenticated by a seal. The right to permit an account to be opened belongs to the banking institution manager.

An application to open an account shall not be considered by a banking institution unless documents affirming the client's legal status are attached to it. Such documents comprise, above all, an order from a ministry or department, a decree or disposition from the Council of Ministers of a union republic, the ispolkom of a local Soviet of People's Deputies, or another organ of state administration which has been granted the right to create enterprises and organizations. If it is necessary to coordinate matters with other organs in accordance with the legislation for their creation, then the appropriate document shall be presented to the bank.

Upon opening an account, enterprises, organizations, and institutions are obligated to present to the USSR bank a card with examples of the required signatures, stamps, and seals. It shall include examples of the signatures, stamps, and seals. It shall include examples of the signatures of all persons who have been accorded the right to sign monetary-payment documents in the depositor's name. The card constitutes a confirmation of the full powers of certain specific officials to dispose of monetary funds in accounts of the USSR bank. As a rule, the following two officials handle the funds in the enterprise's account: the manager of the enterprise, who has the right of the first signature, and the chief (senior) bookkeeper, who has the right of the second signature. The presence of these two signatures on the monetary-payment documents is the most important condition necessary for their acceptance to be executed by the banking institution.

If an enterprise lacks sufficient funds in its account to cover a payment demand at the moment a payment document is presented, it is placed in Cardfile No. 2 according to the bank's rules and is to be paid out in accordance with the established order of payment sequence. Since 1 January 1988, in accordance with the Law and the decree adopted by the CPSU Central Committee and the USSR Council of Ministers dated 17 June 1987 No. 821, there has been a fundamental change

e in the order of payment sequence for enterprises which have converted to full cost accounting and self-financing. It has been established that all payments from enterprises' accounts, including deductions to be paid into the budget and for paying wages, shall be executed following the procedure of the calendar sequence in which the payment documents came into the bank (time of arrival for payment). During the conversion to cost accounting and self-financing enterprises may initially experience difficulties and may need time to adjust their operations to the new system. Therefore, the legislative procedure adopted supplementary measures so that, under the conditions of introducing the calendar sequence of payments beginning on 1 January 1988 timely payments and the payment of wages may be assured.

During the first half of 1988 banks have been permitted to issue short-term credits to these enterprises for payment if they lack sufficient money in their payment accounts. However, such credits can be granted only in cases where the temporary lack of money in the payment account is caused by reasons independent of the financial-management activity of the enterprise concerned (for example, delayed payment for products which it has already shipped).

The credits are issued by way of a privileged procedure (regardless of whether there is an overdue indebtedness on loans obtained previously) for a time period of up to 10 days on condition that the bank be presented with a list of measures ensuring the timely return of the indicated credits. In order to repay these credits, it is permitted to use the free remnants of money being kept not only in payment accounts but also in funds for the economic-incentive funds. The size of the interest rate increases with each successive time that the credit is obtained. In case of an overdue return on a loan, the size of the interest rate for credit doubles.

After the first half of 1988 has gone by, enterprises which have converted to full cost accounting and self-financing will also be able in certain cases to obtain credit for a time period of up to 10 days in order to pay wages when there is a temporary insufficiency of money for reasons independent of their operations. This is to be within the limits of their wage fund, as determined by proceeding from the established norm and the actual results of the enterprise's work. Repayment of this credit will be conducted from the payment account following the generally established procedure. It should be emphasized that the calendar-based sequential order of payments does not extend to enterprises which have not converted to full cost accounting and self-financing nor to organizations in the non-production sphere. For them the sequential order of payments which was in effect prior to 1 January 1988 has been retained, whereby payments are made from accounts depending upon the nature of the payment involved—its being relegated to one of the five established sequential groups.

Regardless of the presence of any other non-reimbursed payments from accounts, enterprises can conduct other credits permitted by banks to meet the reciprocal requirements of the economic organs or to issue money for urgent needs.

The existing legislation provides for the right of enterprises to obtain money within established limits in case urgent needs arise. This money can be used for any needs which come up during the course of production or product sales (account payments, repaying loans to the bank, etc.).

In accordance with the Law, if an enterprise lacks its own money for making payments for output (work or services), it also has the right to obtain credit; its higher-ranking organ may allot money to it by means of centralized funds and reserves. In such a case, the money shifted by a targeted transfer is channeled outside of the sequence of payments directly to pay the cost of the output, work, or services in accordance with a directive from the higher-ranking organ.

Banks shall pay interest to an enterprise on the latter's accounts which have temporarily free assets of its fund for the development of production, science, and technology.

Payments between enterprises are conducted, as a rule, following a non-cash procedure. In contrast to the procedure previously in effect, there is no minimum sum for non-cash payments.

Non-cash payments are conducted by payment demands, letters of credit, payment authorizations, checks, and consolidated demands. When deliveries are smooth, even, and constant, payments can be handled in the planned payment procedure.

Under the new conditions the rights of enterprises to select this or another form of payment have been substantially expanded. The basic document defining the procedure and form of payments is the contract agreement between the parties concerned. In accordance with the legislation and the rules of the USSR Gosbank, the contracting parties can choose the form of payments proceeding from their own interests. Banking institutions have no right to block the execution of payments in accordance with the forms provided for in the contract agreement.

Unjustified restrictions have now been removed on the use of specific forms of payment—with regard to payments made to one and the same city or in different cities.

In utilizing the acceptance form of payments, enterprises have the right to determine independently how the payments will be handled—by preliminary or subsequent acceptance. When payments are made in accordance with the preliminary-acceptance procedure, the

payment demands are deemed accepted and are paid out if the payer does not declare to the banking institution serving him his complete or partial refusal to accept on out-of-town payments during the course of two business days after the receipt of the payment demand by the banking institution. In the case of payments made in accordance with the subsequent-acceptance procedure, payment demands are subject to immediate payment upon being received by the payer's bank. However, the payer has the right to declare a subsequent refusal to accept the payment demand during the course of three business days after the receipt of payment demands in the payer's bank (not counting the day of receipt). On the basis of such a declaration accepted by the bank, the sum paid to the supplier is restored to the payer's account. Banks can increase the time periods established for acceptance by up to 10 calendar days. The contrast agreement provided for the parties concerned can contain any reasons under which a refusal to accept a transaction shall be allowed. Restrictions on a minimum amount in refusals to accept have now been removed.

Changes have been made in the existing rules aimed at speeding up payments. Thus, it has been established that payments amounting to more than 1,000 rubles, when the postal delivery between the banks of the supplier and the payer would take more than three days, upon the request of and at the expense of the supplier, can be transferred by the bank via telegraph. In cases of necessity, banking-institution managers also have the right to set up other, more privileged conditions for telegraph-type letters of advice. If payment demands are not paid out, a supplier can address a request for an explanation of the reasons directly to the payer or to his bank, bypassing his own bank, something that previously was prohibited.

In order to ensure the on-time payments of payment demands which have been accepted with a violation of the rules for formatting them, it has been established that the payer's bank does not have the right to return these documents without executing them, provided that the payer consents to their being paid.

Under the new conditions there has been a considerable expansion in the use of payment authorizations and transaction checks—those forms of payments which are directly linked with the payer's interests. It is now permitted to pay by payment authorizations for any transactions. When there is a lack of sufficient money in the account, payment authorizations can be placed in Cardfile No. 2 for subsequent payment. Now, instead of different checkbooks for payments with transport and for basic activity, an integrated checkbook has been introduced. This creates definite conveniences for the check-writer. Now abolished are payments by means of special accounts, acceptance checks, and via mutual-account divisions, which did not find use in the practical experience of payment relations. Without an enterprise's consent, money can be drawn from its account only in cases provided for by the legislation.

With regard to enterprises which have converted to full cost accounting and self-financing, since 1 January 1988 higher-ranking organs have not been permitted to draw money from their accounts in an undisputed manner, using the procedure for redistributing working capital and profits. Banks no longer have the right to accept such drafts.

Fines, forfeits, etc. imposed via an undisputed procedure are deducted by the banking institution from an enterprise's payment account. It has been established that sums illegally drawn from an account shall be returned to the enterprise by the guilty party in an increased amount. For example, in case of an unjustified withdrawal by a non-acceptance procedure of money from an account for delivering poor-quality goods or incomplete sets of items, the guilty party, in addition to returning the sum that was withdrawn, shall pay to the other party a fine amounting to 10 percent of the sum involved. Higher scales of fines have also been established in other cases of illegal withdrawal of money from an enterprise's accounts. Disputes concerning the return of sums unjustifiably drawn from accounts shall be examined in the arbitration organs and courts (according to the appropriately established jurisdiction).

Sums paid and received in the form of fines, forfeits, and other sanctions shall be relegated by the Law to the cost-accounting fund of the enterprise's collective (Par. 5, Art. 17). With regard to the remaining enterprises, sanctions (except for fines contributed to the state budget) shall be relegated to the profits, subject to channeling into the economic-incentives fund and the funds for other outlays, proceeding from the plan proportions for distributing these profits.

When there is an undisputed fine imposed, and the money is put at the claimant's disposal (for example, in cases of arrears in payments to the budget, certain fines, etc.), as well as in the cases of executive documents and those equivalent to them, the responsibility for the correctness of the penalties exacted shall be borne by the claimant. Banking institutions do not examine the essence of the charges brought by payers against drawing out money in an indisputed procedure. Stoppage or nullification of the penalty shall be allowed solely at the disposition of the claimants or their higher-ranking organs, as well as in accordance with decrees of the arbitration organs or court decisions.

However, in conducting payment transactions, banks exercise monitoring controls over the observance of payment and contract-agreement discipline by enterprises. Under the new conditions the nature of these controls has changed. In connection with the fact that the performance of assignments and obligations with regard to deliveries constitutes the chief indicator for evaluating an enterprise's activity, the banking institutions exercise controls over the observance of contract-agreement discipline by enterprises principally by means of constantly analyzing document turnover, balance sheets,

and other accounting materials received as a result of acceptances being refused. Concerning an enterprise's violations of payment discipline, particularly if this has led to payment of significant interest rates, financial sanctions, and forfeits, the banking institutions must inform the labor collective so that the latter may take the necessary measures.

With regard to enterprises which allow violations of contract discipline to occur, which receive numerous refusals to accept items and demands for the non-acceptance drawing of excessively paid sums for poor-quality products, an influential measure may be applied in the form of setting a deadline for eliminating these shortcomings, after which time a procedure is followed for handling payments with purchasers solely on the basis of preliminary acceptance.

The grossest violation by an enterprise of the rules of payment transactions is the presentation of payment demands which are not backed by any goods. One of the ways to hold parties responsible for presenting payment documents without goods to back them is to impose a fine.

Thus, for presenting for payment through the bank a payment demand, register of goods-transport documents with an accredited form of payments, or other payment document, written out by a supplier (freight-shipper), when there is a complete or partial lack of actual shipment (dispatch) of goods and physical assets or actual rendering of services, the supplier (freight-shipper or organization rendering the services) shall pay a fine to the bank amounting to seven percent of the incorrectly indicated sum.

For issuing a payment authorization or a check to pay for physical assets or services rendered (except for a payment authorization by way of a preliminary payment in cases provided for by the bank's rules), when there is a complete or partial lack of an actual shipment (dispatch) of goods and physical assets or an actual rendering of services, the payer (check-writer) shall pay a fine to the bank amounting to seven percent of the amount of the payment authorization or check which had been incorrectly issued.

When the indicated authorization or check has been issued on the basis of an incorrect (not backed by goods) account of the supplier (freight-shipper), the fine shall be imposed equally on the payer and the supplier (freight-shipper).

The indicated fine shall be imposed upon establishment of the fact of presentation for payment via the bank of a payment demand not backed by goods, regardless of whether or not the purchaser had refused acceptance.

Upon establishment of the fact that a supplier has presented payment documents not backed by goods, in addition to imposing a fine, the bank shall exact the total amount paid on such a document at the same time for the purchaser; it shall also exclude from serving as a credit collateral the demand not backed by goods, and shall establish for the enterprise-violator preliminary controls on the marketability of payment documents presented to the bank. The officials who have signed the payment documents which do not actually correspond to the economic operation transacted shall be charged with disciplinary, material, and criminal responsibility in accordance with the existing legislation.

Banking institutions must inform the enterprise's labor collective about each instance of a discharge or a payment of payment documents not backed by goods.

There has also been an increase in the importance of the complete and timely execution by the banking institutions of their own obligations with regard to handling payments for enterprises, a strict observance of the bank's responsibility, as established by the legislation, for being at fault in violating the rules of payment transaction.

The credit and payment relations between the USSR banks and the enterprises facilitate the secure functioning of the new economic mechanism, strengthen cost accounting, and increase enterprises' responsibility.

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FORESTRY, TIMBER

How Economic Reform Affects Lumberjacks Discussed

814402790 Moscow *LESNAYA PROMYSHLENNOST*
in Russian No 4 Apr 88 pp 6-7

[Article by V. S. Ivanter: "To the Lumberjacks on Economic Reform"]

[Text] *"Perestroyka requires competence and a high degree of professionalism from workers", said M. S. Gorbachev at the January (1987) CPSU Central Committee Plenum. Today we cannot get along without modern and thorough training, without a deep knowledge of production, science, technology, management, economics, psychology and the organization and stimulation of labor. "Rabotnik Lesa", the newspaper of the Cherepovetsles Association, took a useful start in preparing cadre to implement radical economic reform under the USSR Law on State Enterprises (Associations). In its issues of 10 and 24 December 1987 it organized a correspondence school "Preparations for Converting Associations to Full Cost Accounting and Self-Financing." Under this headline there were 15 articles by management workers and specialists from Vologdalsprom and Cherepovetsles.*

The "school" opens with an article, "The Basic Provisions of the Law on State Enterprises (Associations)", by A. Vassentsev, chief of the Main Legal Department at Vologdalsprom. In describing the fundamental legal changes which this law makes, the author says that the most important one is that enterprises are freed from petty tutelage by ministries and agencies and can independently dispose of the public property entrusted to them and can convert to full cost accounting and self-financing. It is now no longer possible to use resources from enterprises which are operating well to support those which are not able to properly organize production. Enterprises themselves should find ways out of situations. Shortages of circulating capital can be replaced by using cost accounting income. Enterprise activity is in accordance with the principles of democratic centralism and the socialist self-management of the labor collective. Enterprise managers are elected (usually on a competitive basis) to improve the quality of management cadre and to strengthen their responsibility for results.

Also of interest are the new powers of enterprises: the ability to dispute illegal juridical acts of superior organs and to recover losses from agencies which published such acts; the free disposal of property entrusted to enterprises and the distribution of profits by enterprises themselves; the introduction of the newest equipment and technology and the right to engage in joint activity with institutes and other enterprises.

However, one must complain that in examining this law the author did not comment upon its implementation relative to activities at Vologdalsprom and its units and

enterprises, nor did he show the specific features of loggers' work under the new conditions. True, this oversight is partially compensated by other materials in the correspondence school.

The costs of logging and sawmill products and ways of reducing them were examined by T. Terekhin, deputy chief of the PEO [Planning and Economics Department] at Cherepovetsles. Analyzing production cost indicators for logging and sawmill operations by enterprises for nine months in 1987, he concludes that the main factor in cost reductions is the fulfillment and overfulfillment of commercial product volume. This is a result of improved technical standards for production, improvements in labor organization and changes in output structure and volume.

The main source for reductions in production costs is a reduction in material intensiveness per unit of output. This is why it is necessary to improve the timber cutting process, increase product output and the utilization of wood wastes, comprehensively utilize timber and improve raw material norm setting and accounting. An effective factor in reducing production costs is increases in capital-output ratios attained by improvements in equipment use through increased shift coefficients. At the same time an important role is played by capital-labor ratios at enterprises. Unit costs of logging operations at the Belozerskiy Lespromkhoz were one-third lower than at the Babayevskiy Lespromkhoz, while the capital-labor ratio was 1.8 fold higher.

Under contemporary conditions higher quality products can be produced at minimal cost only on the basis of scientific and technical progress, by accelerating production mechanization and reducing manual labor through the extensive use of science, technology and progressive experience. L. Shestakov, chief of the Vologdalsprom Association's Technical Department reported that the enterprises in the association are obtaining considerable amounts of new equipment to mechanize logging and lower landing operations. There are now 102 feller-bundling machines, 236 LP-18 and LT-154 chokerless skidder tractors, 425 LP-30B and LP-33 limbing machines at logging operations, while there are 61 PLKh-3AS, LO-15S, LO-113 and other equipment at lower landings.

How well is all this equipment being used? In 10 months in 1987 machine felling at enterprises in Vologdalsprom reached 31 percent of all felling (5 percent higher than this indicator for the previous year), for chokerless skidding the figure was 25 percent and for machine limbing—63 percent. The bucking and limbing of unlimbed trees on semi-automatic lines accounted for 31 percent of all bucking.

However, results could be better if all enterprises would fully utilize the new equipment's potentials. Multi-operation equipment works ineffectively because of large

losses in working time due to organizational and technical reasons. There are low standards for equipment operation, servicing and repair, much of it is only operated one shift per day and operators and mechanics are improperly trained. Progressive collectives' experience is being slowly applied. It turns out that for the association as a whole, during 10 months of 1987, output per LP-19 machine was only 29,000 cubic meters. True, this is 5,000 m³ more than for the same period in 1986, but far from the indicators obtained by progressive units. At the Kichmensko-Gorodetskiy, Veliko-Ustyugskiy and Belorucheykiy Lespromkhoz the figures were 43,700, 40,300 and 41,900 m³ respectively.

An analysis of multi-operation machines on logging sites showed that because of high cost and operating expenses, the LP-19 machines and chokerless skidders lost money at many lespromkhoz. At the same time, the author shows correspondent school students the indicators which multi-operation machines must obtain under the new conditions to be effective. For a felling-bundling machine the effect is obtained if productivity per machine shift is 150m³, the annual output per machine is 38,000 m³ and the use factor is 0.58. For an LP-18 chokerless skidder the figures are 71.4m³, 12,300 m³ and 0.59; and for an LT-154—75m³, 10,300 m³ and 0.5.

The transportation of wood on lines of the Ministry of Railways is an important link in the national economy's forest product supply chain. Having each freight car fully loaded was the message in the lecture by G. Popov, chief of the Transportation Department at Vologdasprom. With the conversion to new forms of economic management, collective contract and self-financing, the rational use of rolling stock acquires ever greater importance. Each excess ruble spent on loading operations or extracted as a fine for excess freight car idle time or incomplete loading is a loss to economic stimulation funds. As an example of rationalization in forest products loading agreed upon railroaders, G. Popov cites the system for loading gondolas with bundles tied down by semi-rigid straps in compliance with local loading gauges. Compared to bulk loading, this system saves up to 138 rubles per 100 m³ of wood just through savings in tie-down wire.

The lecture given by B. Sofronov, deputy general director of the Cherepovetsles Association was on "Improvements in the Management and Organization of Production at Enterprises Working on Full Cost Accounting." He reports that the association was given three state orders which were the basis for signing contracts with customers: orders for roundwood, for wood products (including for export) and for supplying products to an extensive market. He gave planned 1988 indicators: profit, payment for funds, material incentives and social development fund.

Great attention was given to the introduction of collective contracts and brigade cost accounting. The collective at the Belozerskiy Lespromkhoz has been working

on collective contract since 1 July 1987, ten consolidated comprehensive logging brigades, with final phases up to loading timber, and in some instances, up to skidding and limbing, have been set up at the lespromkhoz. Timber skidding brigades have also been set up. Similar work has been done at the Babayevskiy and Vashkinskiy Lespromkhoz.* After the brigades conversion to collective contract labor productivity in the forest increased by 10-15 percent, while for timber skidding by up to 20 percent. There were considerable increases in labor discipline and wages. After conversion to collective contract, a log skidder operators' wages at the Georgiyevskiy Lesopunkt in the Belozerskiy Lespromkhoz increased from 334 rubles (1st quarter 1985) to 414 (1st quarter 1978).

The author justifiably notes that full cost accounting places special importance upon savings in raw and other materials and fuel. He indicates that there are great reserves in this area. If the height of stumps were reduced only 2-3 centimeters this would give Cherepovetsles enterprises 4,000-5,000 m³ of valuable butt wood. Up to 5 percent of wood and much slash is left at logged areas. In wood processing there is practically no rational use of raw material nor is there any waste free technology.

V. Stepanov, chief of the OMTS at Vologdasprom dwelt in more detail on the careful use of materials in the transition to enterprise self-financing and cost accounting. He reported that during nine months of 1987 the association did not meet its targets for saving diesel fuel (short by 624 tons) and gasoline (short by 200 tons). The components of petroleum product conservation are: the reliable storage of fuel, oil and lubricants at petroleum storage bases and fueling stations (Kichmengsko-Gorodetskiy, Nikolskiy, Belorucheykiy and Kovzhinkolskiy Lespromkhoz), accurate accounting for fuel, fueling vehicles and machinery with metered fuel and oil pumps, eliminating unloaded runs for vehicles and turning off engines during mealtime breaks. The author also stresses the need to conserve cement and reduce above-norm waste of other goods.

Ways of improving the use of forest resources was the theme of the lecture by V. Krasikov, chief of the Vologdasprom Forestry Department. He reported that in recent years, with the introduction of surveyed cutting areas, there is a tendency towards reduced overcutting in coniferous forests and an increase in the use of broad-leaved timber. Conditional clearcutting has been eliminated throughout Vologda Oblast. Wood waste utilization increases yearly. However, wood losses at cutting areas are still great. In 1987 the association was fined 1,726,000 rubles for not cleaning up cutting areas, for violating cutting rules, destroying undergrowth and for leaving stumps higher than norms. Under self-financing each ruble in fines for violating forestry rules means a proportional reduction in the enterprise economic stimulation fund and, in the final account, affects each worker's welfare.

The lecture by A. Popov, chief bookkeeper at Vologdalesprom, was dedicated to the system of fines and its influence upon the economic stimulation fund.

There were also lectures by other responsible workers at Vologdalesprom. The normative method of distributing profits and the formation of economic stimulation funds was the theme of a lecture by S. Sonin, head of the Finance Department. V. Yakhl talked about ways of improving product quality; A. Armev about river transportation and G. Fominskiy, OKS [Capital Construction Department] about the economic management system in construction.

The Party says that the press is to assist in the democratization process and to ask questions about the mastery of economic reforms. The correspondence school published in the Cherepovets newspaper *Rabotnik Lesa* is a useful contribution by the sector press to this important matter.

* On the pages of the correspondence school V. Bragin, chief of the Labor and Wages Department gives, an extended description of the essentials of collective contract, procedures for converting to this form of work organization and pay, and the functions of the contract collective council.

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Improving Work of Forest Complex Under New Conditions

814402786 Moscow LESNAYA PROMYSHLENNOST
in Russian No 4 Apr 88 pp 6-7

[Article by N. I. Kokarev, candidate of economic sciences, Kostroma Technological Institute: "Under New Conditions"]

[Text] The transition to full cost accounting and self-financing requires a systematic comprehensive analysis of production and economic management activities at forest industry enterprises. With participation by specialists at the Kostroma Technological Institute, such work was done at the Kostromalesprom Association to determine reserves for improving production efficiency.

In analyzing work conditions at enterprises in the forest complex we delineated the main directions for improving their efficiency: the creation of comprehensive forest enterprises working on a sustained yield basis; the development of collective contract; the implementation of measures for converting enterprises to cost accounting and self-financing.

We will dwell briefly on these directions. Reductions in the forest resource base for lespromkhozes in Kostroma Oblast have led to reductions in timber harvest. A previously forest surplus oblast has now become forest scarce. At Sharye and Manturov there are large plants for the chemical-mechanical processing of wood; at many

lespromkhozes and wood processing enterprises there are sawmills, container production, house building and other production operations which need raw materials. This makes necessary a substantiated forecast of logging, wood processing and raw material supplies.

Together with the Kostromalesprom and the Oblast Forestry Administration, the Kostroma Technological Institute analyzed the forest resource base. This analysis showed that at the present rate of forest use during this decade some lespromkhozes will completely use up their forest resources and will cease to exist. This problem can be partially solved through the redistribution of forests and cutting volumes between lespromkhozes both with regard to their bases and to forests in other categories and managed by other entities.

Studies of forest stocks showed that it was possible to continuously and relatively evenly use forests. However, imperfections in the assignment of forests to users and in forest use can lead to depletion of some areas and the preservation of others. We think that the Kostromalesprom Association should redistribute cutting volume in the resource bases of its lespromkhozes and, together with the Oblast Forestry Administration, solve the question of transferring, to lespromkhozes, forests which had not previously been assigned to them. The main thing is to transfer all work (logging and wood processing and forest growing) to one master. The planned development of forestry and the timber and wood processing industry requires full time integrated enterprises.

The analysis determined secondary timber resource use volumes. The main direction here is to produce chips for chipboard. Calculations show that the complete use of timber, including chipboard production, in Kostroma Oblast will make it possible to increase commercial output by 28-35 percent, labor productivity by 62 percent and profits from product sales by 13 million rubles. Thus, the complete use of wood is the main direction for increasing the profitability of forest industry enterprises.

Brigade and collective contracts are being successfully introduced at many enterprises in the Kostromalesprom Association. An analysis of these enterprises' work in recent years shows their economic efficiency. Output per tractor shift in contract brigades is 15 percent higher than in ordinary brigades; labor productivity per man day in timber felling operations is 16 percent higher; in lower landing operations, 6-9 percent higher; fines for forestry violations are 4.7 fold lower; production costs per cubic meter at felling operations is 7 percent lower and at lower landing operations 5 percent lower. Earnings per worker are 5-10 percent higher. During 1986 brigades working by the collective contract method saved the association 67,800 rubles worth of materials. The introduction, in April 1987 of collective contracts at the Ponizovskiy Lespromkhoz, which was one of the biggest losers in the Association (a 54.55 percent loss rate) helped it achieve good results. For results in socialist competition among logging enterprises in the 2nd and

3rd quarters of 1987 the Board of USSR Minlesbumprom [Ministry of the Timber, Pulp and Paper and Wood Processing Industry] and the Presidium of the Trade Union Central Committee named the Ponizovskiy Lespromkhoz the victor and gave it a money award and a Jubilee Honorary Diploma from the Ministry and Trade Union Central committee. This lespromkhoz is the only one in the association to fulfill its sales plan, including delivery targets, every quarter. During this period the association fulfilled its plan by 95.4 percent.

The Kostromalesprom Association has a low profit rate. It includes 28 enterprises, 13 of which are losing money. The main losses are from hauling timber, extracting resin, producing chips, lumber and boxes.

Losses at logging operations are to a great extent explained by the high costs of skidding timber (18.3 rubles per m³). The increase in production costs is a consequence of the steadily deteriorating natural and geographic conditions faced by logging operations: increased hauls, timber supplies per logging site reduced from 4,400 to 3,000 m³, average unlimbed tree size reduced from 0.3 to 0.28 m³.

In recent years the the association has been engaged in depletion cutting operations. This reduces the quality of timber cut: 47.7 percent is coniferous and 52.3 percent broadleaved. The depletion of the forest resource base leads to reductions in logging (the five-year plan calls for a 500,000 m³ reduction), increasing fixed costs per cubic meter. In addition, logging costs are increased by the lack of production capacity in the summer zones, the unsatisfactory condition of dirt and winter roads and low readiness factors for machinery and equipment.

Among the reasons for losses by logging operations are the low wholesale price per cubic meter of timber (15.5 rubles). This is a consequence of the increased share of low value trees. In 1986 aspen made up 38 percent of the timber stock. We think that it is necessary to increase wholesale prices for timber products. Prices should not be reduced for chips made from broadleaved timber. There is a 35 percent price gap between coniferous and broadleaved chips even though production expenses are equivalent.

Lumber production losses are caused by high transportation costs (these are due to the shortage of sawmills in logging zones), the use of small trees, uneven operations by sawmills because of equipment breakdowns and disruptions in timber supplies throughout the year and the low prices for broadleaved sawlogs.

The main reason for losses in pitch extraction are: long distances between pitch extraction areas, reductions in the share of coniferous trees in total stands (5 percent of all species). These factors, and difficulties in getting workers to extraction areas, reduce labor productivity and efficiency as a whole.

As a result of measures to eliminate losses, according to our estimates by 1990 they should be 12.8 percent in logging and 11.5 percent in chip production.

These are the main ways to improve the efficiency of work in logging enterprises during the conversion to full cost accounting and self-financing.

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POLICY, ORGANIZATION

Rutgayzer, Others on Retail Prices, Population Income

18270057 Moscow *EKONOMICHESKIYE NAUKI* in Russian No 2, Feb 88 pp 44-52

[Article by Valeriy Maksovich Rutgayzer, professor, doctor of economic sciences, and chief, Department of Social Problems and Forecasting National Prosperity, NIEI [Scientific-Research Economics Institute and USSR Gosplan [State Planning Committee]; Andrey Igorevich Shmarov, candidate of economic sciences, and chief, Sector of General Social Problems and Planning the National Standard of Living, NIEI under USSR Gosplan; and Andrey Vasilyevich Chernyavskiy, senior scientific staff member, Sector of Public Production Structural Optimization, NIEI under USSR Gosplan: "Dynamics of Retail Prices and Population Income"]

[Text] The economic literature has recently contained quite a broad-based and sharply pointed discussion concerning the question of the basic principles of the consumer-goods price reform. Opinions are divided here. Some economists

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assert that the essence of the reform lies in eliminating price subsidies on a range of goods and services with appropriate compensation to the population (amounting to the total sum of the price rise on the formerly subsidized items) along the line of increase of monetary income and the decrease of prices on goods containing a considerable amount of turnover tax. Moreover, this assertion does not apply to the socially oriented forms of subsidies, i.e., those on items in the children's assortment, medications, and certain other consumer goods. But other writers insist on the necessity of "following a line aimed at maintaining relatively lowered prices on goods which satisfy the needs for human life, or which facilitate the formation of a harmoniously developed, individual personality,"

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and also directed at balancing subsidies applied to retail prices by means of profits and turnover taxes from producing and selling other consumer goods and paid services. It is this point of view that we would like to discuss.

Its advocates assert that price subsidies on many items are not connected with the unbalanced nature of the effective demand and supply of goods and services. Of course, the price factor is merely one of many which regulate the correlation between demand and supply, and the principal condition for a balanced quality, of course, has to do with the production sphere. But an underestimation of the distributive relations, in particular, the role played by subsidies, is also fraught with unfavorable tendencies in the economy's consumer sector. In our opinion, low, subsidized prices on goods and services merely exacerbate their shortages and lead to a regulated distribution of many consumer items. Also

extremely important is the fact that the sale through the State Cooperative Trade Network of meat and dairy items, as well as types of paid services such as housing and municipal services, urban passenger transportation, services in several sectors of culture and art, recreation institutions, and communications, have remained, to a large extent, outside the framework of distribution by labor. In ever-increasing measure the distribution of these items is being carried out not in accordance with labor but rather in accordance with the principles close to the utilization of the public consumption funds. As calculations conducted in the NIEI under Gosplan have shown, the active development of such tendencies has led to a situation whereby in 1985 one ruble of wages accounts for 87 kopecks of all other sources of people's well-being (public-consumption funds, income from private, subsidiary farmsteads, individual labor, interest on savings deposits, and subsidies on retail prices), whereas in 1965 this figure was only 62 kopecks. Hence, even a lowering of labor's prestige in collectivized labor is thought of as a fundamental factor of social development and the growth of the national well-being.

In the opinion of the advocates of the point of view under discussion, the constantly forming divergences of prices from costs do not violate the principle of social justice in distribution; price subsidies are considered to be the normal condition for implementing the population's income. "...Within the price system a particular place is occupied by the relatively low prices on meat, milk, butter, and other animal products. The population's demand for these products and items made from them has increased substantially in recent years, and they have become part of the diet of all strata of the population, regardless of income levels. However, the demand for these products has not yet been fully satisfied. "A considerable differentiation has remained in the consumption of these products by various groups of the population and regions of the country," reports one writer, and he draws the conclusion that under these conditions in order to improve the population's food supply, "it would be feasible to proceed in a better-planned and more decisive way to increase its sale at appropriate prices not only in the rural areas but also in the cities, including the major ones."

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We will not dispute the theoretical truth of this proposition, and we will comment solely on the practical aspect of the problem of correlating subsidization and socially equitable distribution.

The fact of the matter is that during the last three five-year plans the socially inequitable differentiation in the population's consumption has intensified. Thus, in connection with the sale of live stock-raising products (in relation to the state prices on which, as is known, there is a subsidy), we note the circumstance that the average prices to obtain them are higher among population groups with relatively low incomes than among high-income groups. Thus, in the group with incomes of less

than 50 rubles a month per family member the average purchase price of one kilogram of beef is 1.6 times, and for mutton almost 1.7 times higher than it is in the group with incomes of more than 200 rubles a month per family member. Thereby the latter receive a relatively larger part of the subsidy on these prices. This is connected, to a decisive degree, with the fact that the comparatively better-off groups of consumers have more favorable opportunities for obtaining livestock-raising products at state retail prices (in particular, through the system of orders). Furthermore, the heads of high-income families are employed, for the most part, in those sectors of industry where a closed system has been set up for distributing meat and dairy products at state retail prices. But the members of the less-well-off strata are frequently forced to turn to the cooperative trade network or to kolkhoz markets. This, of course, does not correspond to the principles of social equity in distribution.

Socially inequitable distribution of subsidization also manifests itself in the following cross-sections:

a) city-village—in rural localities meat and dairy products are hardly sold at all at state retail prices;

b) cities of various ranks—most meat is sold at state retail prices in Moscow, Leningrad, as well as in the capitals of union republics and in oblast centers. Moreover, the free and uninterrupted sale of meat exists only in a limited range of cities. The smaller the city, the smaller, as a rule, is the proportion of marketable meat sold at state retail prices;

c) union republics—to a relatively lesser degree, meat and milk are sold at state retail prices in the Central Asian republics, and to a greater degree—in the Baltic republics. Unevenness in meat sales at state retail prices has also manifested itself when other union republics are compared.

It should be borne in mind that the acuteness of this problem is increasing, for if in 1965 there were 12 kopecks of subsidy for every ruble of wages, in 1985 this figure was 24 kopecks.

The ideas set forth here attest, in our opinion, to the presence of a genuine link between subsidization and the violations of the process of collective demand. That is why it seems urgent to abandon subsidies (with the exception, we repeat, of their socially oriented variants), and this, moreover, assumes a very careful analysis of all the socioeconomic consequences of such a measure.

It should be noted that right up to recent times solution of the problems of an imbalance between effective demand and supply was linked, to a decisive degree, with an increase in the scale of producing consumer goods and paid services.

Considerably less attention has been accorded to the variant of regulating demand by means of improving distribution relations and the system of consumer prices. And the changes made during the second half of the 1970's and at the beginning of the 1980's in retail prices and rates on a limited number of goods and services (for the most part, in an upward direction) were fragmentary in nature and provided merely a short-term effect (as a rule, not lasting more than 1-1.5 years).

To our way of thinking, palliative measures with regard to regulating effective demand would not ensure the sought-after correspondence between the population's income and its outlays. Along with a consistent implementation of the production aspect of achieving a balanced quality in the consumer sector (i.e., with an expansion in the output of goods and services), as well as with precise monitoring controls on coordinating the dynamics of labor results with the measure of its wages, *we need to radically reform consumer prices and distributive relations.* In accordance with the already-noted positions of many economists and sociologists, which we share, the contents of such a reform would boil down to the following: *eliminating most subsidies, in tandem with a corresponding rise in retail prices and rates on paid services; monetary compensation to the population by means of wages and payments from the public consumption funds; lowering prices on certain types of non-subsidized items by means of reducing the turnover tax. The total compensation to the population (in terms of money and by lowering prices on a range of items) should correspond to the magnitude of the increase in prices on the presently subsidized goods and services. The complexity of the problems of price formation was emphasized by M.S. Gorbachev, when he explained in Murmansk the basic concept of the impending changes in retail-price formation.*

4

Promulgating the reform in consumer prices and the population's monetary income based on these principles is an act of great social significance. It is called upon to eliminate the factors of socially inequitable distribution of subsidies on retail prices. The reform will undoubtedly bring about serious shifts in the economy's consumer sector, and these shifts will, in turn, exert an influence on the entire system of public reproduction.

Before proceeding directly to an analysis of these shifts, let us note the following.

There is an opinion to the effect that a coordinated price rise on goods presently being subsidized and compensation along the lines of the population's monetary income could create a difficult-to-overcome inflationary process connected, in the first place, with an increase in the mass of net income and, stemming from that, the expansion of financial-credit investments in the national income, and, in the second place, with an increase in production costs. To our way of thinking, such a proposition is vulnerable. After all, the mass of net income increases in proportion

not to the eliminated subsidy, but substantially less—on the level of the difference between the magnitude of the price rise and the amount of their compensation reduction on taxable items. Furthermore, an increase in the population's nominal income in the compensation procedure could be implemented by means of removing the income tax. And this certainly would not bring about an increase in production costs.

Apprehension has also been stated that the price increases on meat and dairy products would lead to a decline in the level of their consumption in low-income families. The argument here runs as follows: "...the social effect from compensation would soon be dissolved in total income, would lose its targeted nature, and would be utilized for purposes other than improving nutrition."

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The problem is, indeed, a serious one. It presupposes, first of all, a specific explanation of to what degree the reform would affect the interests of various groups of the population. We are convinced that, as a result of conducting this reform, the level of consumption of meat and meat products being sold through the retail-trade channels would rise among members of the low-income strata in physical terms, albeit only insignificantly, but it would rise. Is this a paradoxical conclusion? But it flows logically from the following facts.

In the first place, as already noted, the average purchase prices on meat and meat products for less-well-to-do people are substantially higher than for well-off groups of the population. Consequently, the price index on meat products, which after the reform will, of course, rise, will be unequal for various income groups. For low-income groups, which now purchase more expensive products on the average, it would increase to a lesser extent, while for high-income groups it would be a substantial increase. In other words, the less-well-to-do strata would feel the price change under examination to a minimal degree in their own budgets.

In the second place, as a result of the reform, the market for the most expensive livestock products would be balanced, and demand would come into line with supply. This is understandable, for the price on meat products would double on an average. And so the shortage would cease to stimulate the "washing out" of products in the cheap assortment and a tendency to sell meat products at a standard price. The possibility would arise of sharply differentiating prices on food, depending on its quality. Thereby the less-well-off strata would obtain meat products in accordance with their purchasing capacities: comparatively cheaper but in greater quality.

Moreover, increasing meat consumption is a persistent problem for less-well-off families. Consequently, in such families even the compensatory wage supplement will also go, most likely, specifically to purchase meat products.

Of course, among these population categories there will be decreased consumption with regard to other items of expenditure. Guideline calculations attest that monetary outlays on bread and other bakery products, potatoes, items of clothing and footwear will be reduced. At the same time, outlays on paid services will increase. But expenditures on durable goods will remain virtually unchanged. In operation here are two factors which have moved in different directions and which cancel each other out: on the one hand, the purchase of cultural and everyday-household types of items are comparatively less urgent for low-income strata, but, on the other hand, the prices on them will be reduced quite substantially. And inasmuch as the price compensation will be carried out specifically on these goods, their consumption will increase under the conditions of stable expenditures.

Thus, in the consumption structure of the less-well-off groups qualitative shifts will occur, to our way of thinking. There will be an increase in the consumption of food products of animal origin and a reduction in poor-quality foods. With regard to clothing and footwear, here it is necessary to provide for an expansion of items in the cheap assortment.

Concerning the overall consumption of meat products, we obviously can speak, first of all, with regard to the highest income groups of the population. This does not mean that the situation of these groups will become sharply worse; more likely, their meat consumption will approach the level of an optimal consumer budget. As to the remaining items, expenditures and consumption will increase, moreover, quite tangibly—on cultural-everyday and household types of items—by approximately 25-30 percent.

Very useful and multifaceted forecasting of this reform's possible consequences is necessary for a timely reorientation of the structure of public production. Otherwise, the national economy could prove to be incapable of satisfying the population's changing consumer demands.

We have made an attempt to determine the socioeconomic effect of the reform in consumer prices and distribution relations; we have calculated the forecasts of the population's effective demand for goods and paid services, established the trends of change in differentiating the consumption of the most important consumer goods, analyzed the conditions for forming the population's monetary savings, and, finally, estimated the influence of the proposed consumer processes on the dynamics and structure of public production as a whole.

The first task, namely *calculating the forecasts of effective demand*, consisted of elucidating the prospects for the development of this effective demand: first, while retaining the present-day tendencies in forming monetary expenditures, as determined by the existing system of consumer prices, and second, as a result of raising the prices on goods and services being subsidized (taking into account the compensatory increase of monetary

incomes and the lowering of prices on certain types of non-subsidized consumer goods by means of a turnover tax)] The deadline for carrying out the price reform has been provisionally "set" in our calculations as the end of the current five-year plan. The range of goods and services being subsidized included meat and meat products, milk and other dairy products, potatoes, certain kinds of vegetables, bread and other bakery products, certain other food products, housing and municipal services, and urban passenger transport. The amounts of the subsidies to be used per unit of consumption of various goods and services were set at the present-day level. Moreover, consideration was accorded to the necessity for retaining the socially oriented subsidies on a number of goods and services.

There is a complex and multi-valued question concerning the determination of the proportions between the price and monetary compensations, and within the composition of the latter—the dimensions of increasing the incomes of certain groups of the population. The calculations carried out were based on an approach which was developed in the Sector of the Problems of Population Incomes and Distribution of NIEI under USSR Gosplan. According to the approach, the monetary compensation is established by means of abolishing the income tax from the wages of workers and office employees, and the size of the payments from the public consumption funds—proportionately to the actual increase from labor. The difference between the total magnitude of the price increase and the size of the monetary compensation is reimbursed by means of lowering the prices on non-subsidized items.

Such an approach is, of course, somewhat schematic. But it does allow us to examine in an integrated manner the general conditions for forming a system of consumer prices, monetary incomes, turnover taxes, and income taxes levied on workers and office employees. In addition to everything else, carrying out this reform in accordance with the above-indicated principles allows us to solve the long-overdue problem of abolishing income taxes for workers and office employees. Thereby we would achieve a socially equitable uniformity in distribution with regard to workers and office employees, on the one hand, and to kolkhoz members—on the other hand (the incomes of the latter, as is known, are not subject to taxes). Furthermore, the general level of nominal incomes would not decline; everything lost as a result of the rise in prices would be reimbursed in the form of a compensatory increase in the monetary incomes of the population and a reduction of prices on other goods.

An appropriate economic-mathematical apparatus was prepared in order to calculate the variant forecasts of effective demand under the changing economic conditions. It included a model for differentiating the population's monetary expenditures describing the dependence of the formation of various articles of consumer outlays on the dynamics of the population's monetary

income and a model of the targeted function of consumption, designed to calculate the matrix of coefficients of the direct and cross-sectional consumption elasticities by prices.

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In order to analyze and forecast the population's monetary savings, use was made of a model of their formation, taking into consideration the principle of the movement of a portion of savings in the population's monetary outlays as incomes increase and under the conditions of a balanced consumer market.

According to the first variant of our prediction (See Table), which presupposes a prolongation of the evolving conditions of fulfilling demand, the structural shifts in the consumer complex will be carried out at an insufficient pace. As was the case before, there will be a predominance of expenditures on the purchase of food products, whereas the share of outlays on cultural-everyday and household types items within the total consumer expenditures on goods and services will rise very insignificantly—by less than 2 percentage points. Nor will the proportion of expenditures on paid services increase by much—by 3-4 points.

It should be noted, in particular, that with the retained structure of consumer prices and the growth of monetary incomes in the future, the demand for meat and dairy products could rise sharply (according to estimates, the demand for these products, which are sold through channels of the state and cooperative trade network, by the beginning of the next century could attain an amount of more than 100 kg [kilograms] per capita).

The evolving (according to the variant being examined) demand of the population for meat and dairy products exceeds the limits not only of the optimal consumption norms, but also the actual production possibilities. In the future, therefore, there will be an inevitable increase in the unbalanced quality of the food-products market, but the presently existing shortage of meat and dairy products will increase if retail prices are kept at the present-day level and with the proposed increase in monetary incomes.

The second variant of the forecast, in contrast, provides for the attainment of a balanced quality between the demand for goods and services and their supply.

Increasing prices on meat and dairy products, as follows from an analysis of the system of elastic demand with regard to prices,

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would lead during the years of implementing the reform, on the one hand, to quite a significant reduction in the consumption of meat products in kind (although monetary expenditures on their purchase will increase)] On the other hand, the rising level of outlays on meat products will bring about a lessening in the demand for cultural-everyday and household types of goods and paid services (with the exception of housing and municipal

Correlation between Forecast Variants of the Dynamics of Effective Demand, in %*

Consumer Outlays	In Reform Year After 5 Years After 10 Years After 15 Years							
	**	***	a	b	a	b	a	b
Food items	124.9	96.0	126.5	95.9	120.8	93.2	118.6	92.3
of animal origin . .	133.5	97.4	137.5	89.4	128.0	87.0	123.7	86.1
Non-food items	102.6	115.1	107.0	120.1	104.8	118.8	102.0	116.8
clothing, footwear, and fabrics. . . .	110.3	110.3	109.2	109.2	100.4	100.4	90.1	90.1
cultural-everyday, household, and miscellaneous in- dustrial goods . .	97.0	118.7	105.4	128.4	107.9	132.0	110.4	135.8
Miscellaneous services	119.8	105.6	123.9	110.4	115.4	110.5	118.4	117.5

* First variant = 100 percent.

** a = Second variant in changed prices.

*** b = Second variant in comparable prices.

services, urban passenger transport, and children's pre-school institutions. Expenditures on products of plant origin, alcoholic beverages, clothing, and footwear will remain virtually stable. This circumstance allows us to consider that it would be feasible to implement the price compensation specifically along the line of cultural-everyday and household goods and paid services. Price compensation (amounting to 18-22 percent) will enliven the business conditions for demand in this market. As a result, during the course of the 13th Five-Year Plan the consumer complex will be able to expand at quite a rapid rate. The average per-capita monetary expenditures on goods and paid services will increase by 27 percent. Moreover, the growth of savings will steadily decline, and within five years after the reform is carried out the size of their annual increase will be stabilized.

As a result of the proposed direction of the reform, the unsatisfied demand for meat, meat products, and other foodstuffs in short supply will be eliminated. Therefore, as already noted, even their average purchase prices for the population's various groups will be formed in connection with the action of various economic factors *per se*. In other words, these prices will begin to rise in proportion as incomes increase, thus allowing the purchaser with a free choice to obtain better-quality goods at higher prices. Thus, despite the fact that differentiation of monetary outlays on meat and meat products will grow by a factor of 1.25 after the reform, the difference of their consumption in physical terms will decrease by a factor of 1.7. There will also be a reduction

of the differences in the level of consumption of other very important food products, and this corresponds, in large degree, to the concept of the socially equitable distribution of consumer goods.

Subsequently, the growth rate of consumer expenditures will stabilize somewhat, although their structure will change very substantially. At the beginning of the next century the proportion of outlays on cultural-everyday and household types of items will comprise 29 percent of the total volume of consumer expenditures (as compared to 26 percent during the year when the reform is conducted); the share of expenditures on products of animal origin will constitute approximately 58 percent of all monetary outlays on food products.

It should be noted that the proposed effect of restructuring demand is more evident when we evaluate the shifts in the structure in comparable ("pre-reform") prices. The level of expenditures on cultural-everyday and household types of items according to the second variant of the forecast will amount to more than 36 percent of consumer outlays by the beginning of the 21st century, whereas, according to the first variant, it can amount to only 28 percent. Outlays on payment for services will rise to 16 percent (to only 14.5 percent according to the first variant). Within the structure of food-product purchases there will be some reduction in the share occupied by products of animal origin—from 55 percent, according to the first variant, to 52 percent, according to the second variant. The magnitude of growth in savings (both organized and unorganized), according to the second variant

of the forecast, will reach 9 percent annually. The analysis which we conducted has shown that, under the conditions of a balanced market, the saturation level of savings will constitute approximately 11 percent. However, this is an extreme magnitude which in reality will not be achieved. Hence it follows that the annual level of savings growth amounting to 9 percent corresponds to the concepts of a balance between effective demand and supply (and is close to saturation). This means that, over the course of 15 years after the reform is carried out, a unique "transitional period" of developing consumer processes will be completed—a period of forming a steady demand for food products, the formation of a stock of up-to-date durable goods, and satisfaction of the needs for a complex of paid services. It is specifically with implementing these processes that the achievement of a qualitatively new level of working people's well-being must be connected.

The forecasting calculations allow us to single out the following stages of change in the dynamics and structure of consumer demand under the conditions of the price reform and the population's monetary income. The *first stage* (approximately 5 years) is marked by a sharp animation of business conditions in the market for non-food items and paid services. In the *second stage* (over the course of the ensuing 5-10 years) there will be a certain stabilization of consumer processes, connected with the formation of a unique consumer standard. The *third stage* will extend beyond the year 2000 and will, obviously, be linked with developing consumption under qualitatively different conditions, corresponding quite fully, in our opinion, to the ideas of strengthening the labor nature of the socialist way of life. Combination of the labor orientation inherent in socialism (and which is now being violated to a substantial degree) with an increase of labor productivity, a sharp acceleration of scientific and technical progress, very precise monitoring controls on the direct implementation of the principle of distribution according to labor must provide a uniquely cumulative effect in activating the labor factor. The reduction of the length of the work week which stems from this, along with more intensive labor on the production line, require an appropriate use of the newly freed-up time. What we are talking about here is creating a highly organized recreational sphere in the broad sense of the term, one which would provide the goods and services for a high-quality and diverse spending of leisure time and for full compensation for highly intensive labor.

The consumer price reform will also bring the population's effective demand closer to resource limitations during the future period. Use in our calculations of a dynamic physical-cost model of the inter-sectorial balance has shown that this is connected with a weakening of the "pressure" of the demand on agriculture, more precisely, on its capital-intensive and low-efficiency sectors—livestock raising and fodder production. The declining need for corresponding capital investments substantially covers (according to the second variant of

the forecast) the amount of additional demands for investments to accelerate development of the production of cultural-everyday and household types of goods and paid services. The savings on capital resources which come about in this connection could be utilized for expanding other channels in the growth of the national well-being (in particular, for developing sectors of the socio-cultural complex).

We must, however, bear in mind the relative (according to the demand variants) nature of investment economies. As to real gains in resources, they would emerge only when and if the amounts of relative economies "lead" the overall total need for capital investments to a level lower than that conditioned by the resource variant of the dynamics of the macroeconomic indicators.

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Thus, the proposed effect of restructuring the consumer-price system could be provisionally regarded both as a purely social (affecting mainly the consumer sector and influencing economic processes indirectly), and as a socioeconomic, i.e., directly influencing consumption along with economic dynamics as a whole.

The concepts adduced here do not pertain to the general factors of improving price formation or questions of influencing the reform of consumer prices for production. In other words, they will affect only the social, "distributive" aspect of the problem. Its "production" aspect requires a special analysis.

Footnotes

1. They include, in particular, Yu. Borozdin, T. Zaslavskaya, V. Mayer, N. Petrakov, and Shatalin.
2. A. Deryabin, "Improving the Price System," *PLANOVOYE KHOZYAYSTVO*, No 1, 1987, p 82.
3. G. Chubakov, "Trends in Improving Retail Prices," *VOPROSY EKONOMIKI*, No 1, 1987, pp 70-71, 72.
4. See M.S. Gorbachev, "Unfading Exploit of the Polar Heroes," *PRAVDA*, 2 October, 1987, p 2.
5. *VOPROSY EKONOMIKI*, No 1, 1987, p 71.
6. The coefficient of direct consumption elasticity by price shows by what percentage points there is a change in all consumption (in physical terms) of various goods as the price on it changes by 1 percent. Accordingly, the coefficients of cross-sectional elasticities reflect the percentage of change in the consumption of some goods as the price changes on other goods by 1 percent.
7. The design of the matrix of the coefficients of consumption elasticities by prices was done by I.A. Glinkin, senior scientific staff member of the NIEI under USSR Gosplan.

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8. According to our calculations, there will be no such gain. Moreover, we will need approximately 40-50 billion rubles of additional capital investments to be channeled into light industry, into the production of durable goods, the lumbering and wood-processing industry, as well as into the system of paid services. It is important to

emphasize that pushing back the deadline for completing the reform would merely magnify this need.

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ORGANIZATION, PLANNING, MANAGEMENT

Gosplan Official Discusses Current Status, Future of Machine Building

18340044a Moscow *PLANOVOYE KHOZYAYSTVO* in
Russian No 5, May 88 pp 14-23

[Article by G. Stroganov, deputy chairman, USSR
Gosplan, doctor of technical sciences, professor:
"Machine Building Today and Tomorrow"]

[Text] The 27th CPSU Congress noted that machine building has key role to play in accelerating scientific-technical progress. The program for modernizing Soviet machine building poses the task of significantly raising the level, quality and competitiveness of machines, equipment and instruments, attaining the world level in relation to the most important types of equipment and satisfying the growing demand of the national economy and foreign trading partners for modern machine building products by the year 1990. The long-range scientific-technical strategy and priorities for development of the machine building complex have been determined.

The steps taken to accelerate development of machine building produced positive results in the very first two years of the current five-year plan, thus confirming the correctness of the strategic line directed at surmounting stagnant phenomena in engineering and economics. Life persuasively attests to the inexhaustible reserves for creating and modernizing machine designs, raising production effectiveness and expending material, technical and financial resources economically. These reserves can be uncovered by improving the economic forms and methods of the economy's control and planning in correspondence with the USSR Law on the State Enterprise (Association), and by activating the human factor.

The labor collectives of the associations and enterprises, and scientists and specialists of the machine building complex, have been able to fulfill the planned quotas for raising the rate of renewal of machine building products, which increased from 3.1 percent in 1985 to 9.1 percent in 1987. The proportion of the most important types of articles corresponding to the world level attained 49.5 percent of the production volume. Efforts to produce equipment furnished with microprocessors have been initiated; production of microprocessors in machine building sectors has been organized in support of these efforts. Over 4,500 models of new equipment corresponding to the world level were placed into production, while over 5,800 items of obsolete machines and equipment were taken out of production.

Introduction of the state acceptance system has had a positive effect on product quality. The organization and equipment level of production improved, and production discipline and responsibility increased at many plants. The proportion of products passed by state acceptance upon first presentation was 81.4 percent in late 1987.

Furnishing Soviet equipment with automated and microprocessor control systems, raising its life, reliability, productivity and output capacity, and making wide use of progressive construction materials, production processes and equipment have become some of the most important factors promoting growth in the technical level and competitiveness of Soviet equipment.

In the past two years of the current five-year plan the mean annual rate of growth of production increased by a factor of 1.4 in comparison with the corresponding period of the previous five-year plan. Instrument making industry is developing at 1.6 times the rate of machine building as a whole, while electrical engineering production is developing at 1.3 times that rate.

The structure of the metalworking equipment being produced is consistently improving. The required growth of production of machining centers and or rotary and rotary-conveyor lines has been attained, the scale of use of laser, plasma, cathode-ray and other progressive machining methods and of progressive metal welding has been expanded, and production and restoration of machinery and equipment parts bearing strengthening and protective coatings has been enlarged. Series production of automatic resources for technical diagnosis of machines and equipment, nondestructive control resources and resources for monitoring the state of the environment has been initiated. In chemical and petroleum machine building, production of complete production lines, installations and units was increased by 13.7 percent. Production of compressor stations in a modular containerized design has begun.

In accordance with the state plan, over 10,500 units of the most important types of machine building products were manufactured in 1987 as a substitute for equipment purchased in capitalist countries; this includes 380 units of metalworking equipment, 215 units of chemical and polymer equipment, and 9,000 units of computers and instruments. The quotas for producing special production equipment for the internal needs of machine building were met; the volume of production of such equipment grew by a factor of 1.9.

The quantity of subsidized enterprises was reduced by a factor of 1.5. Over 60 percent of machine building enterprises are operating stably and fulfilling and surpassing the targets of the state plan, and around 40 percent are meeting their contracted obligations.

The quotas of the five-year plan concerned with the volume of production of nondietary consumer goods were surpassed by over 500 million rubles. The technical level and quality of these goods is rising.

Sector science is now better-equipped with computer-aided design and production preparation systems. In 1987 the level of automation of design and production increased by a factor of 1.6 in comparison with 1986.

In the last two years the volume of articles and parts made from industrial ceramics used in industry was increased by a factor of 5.5, and the quotas for utilizing composite materials were met. Use of such materials grew to 39,600 tons in 1987, though the absolute level of use of these articles and materials remains extremely low.

In 1986-1987 the availability of effective types of rolled metal to machine builders was increased by an average of 32 percent, while that of structural plastics was increased by 80 percent. In 1988 the rotating reserve of rolled ferrous metals attained 33 days as opposed to the 28.6 planned for 1987, which is equivalent to increasing the availability of rolled metal by 300,000 tons. The machine building ministries were granted the right to order the materials they need, to include finished rolled ferrous metals and steel piping, on the basis of contracts.

The state of affairs in capital construction is improving. In the last two years 1.34 times more capital investments into industrial construction were assimilated than in the corresponding period of the past five-year plan. The levels of assimilation of annual allocations of construction and installation work associated with erection of industrial facilities increased in machine building as a whole from 86 percent in 1985 to 98 percent in 1987. The proportion of outlays on reequipment and reconstruction of existing enterprises of the machine building complex increased from 48 percent in 1985 to 54 percent in 1988.

Construction of experimental bases and organizations for sector science proceeded on a wider scale than in the previous five-year plan. The total volume of capital investments allocated for industrial construction and utilized for these purposes was 6.5 percent in 1986 and 10.5 percent in 1987.

To satisfy the quotas for replacing active fixed productive capital, in the two years the machine building ministries withdrew around 160,000 units of metal-cutting machine tools and over 29,000 units of forging-and-pressing equipment, though the rate of its withdrawal cannot as yet insure fulfillment of the quotas in their entirety. What has been done has made it possible to reduce numerical growth of the production equipment pool and somewhat increase the shift coefficient of its work. Renewal of active fixed productive capital was accelerated in the machine building complex as a whole from 9.1 percent in 1986 to 11.8 percent in 1987.

Despite progressive changes in the past years of the five-year plan, we have not been able to completely close the gap in the development of machine building. After a good start in 1986, the machine building complex worked less stably in 1987.

A number of enterprises of the USSR Ministry of Machine Tool and Tool Building Industry, the USSR Ministry of Electrical Equipment Industry, the USSR

Ministry of Agricultural and Tractor Machine Building, the USSR Ministry of Heavy, Power and Transport Machine Building and the USSR Ministry of Chemical and Petroleum Machine Building did not fulfill their planned quotas in relation to assortment and contracted obligations, in relation to reducing the cost of products and placing new capacities into operation, and in relation to placing new equipment into production. They did not work rhythmically, they did not make full use of their production potential, production preparation remained weak, and interruptions occurred in material and technical supply and in deliveries of supplementary article on the basis of intersector and internal cooperation. This caused a decrease in the prescribed rate of resource conservation and delivery of article for export.

The rate of growth of commodity production was 111.3 percent in the two years as compared to the planned 112.6 percent. The plan for the two years of the five-year plan was fulfilled by the USSR Ministry of Instrument Making, Automation Equipment and Control Systems and the USSR Ministry of Automotive Industry.

In 1987 the machine building complex fulfilled 96.2 percent of its contracted obligations as compared to 98.5 percent in 1986. On the whole, only 35 out of the 172 quotas for the most important type of products were fulfilled. Penalties for late delivery of articles and delivery of poor quality articles were over 1 billion rubles in 1987, or 7 percent of the total profit. The shortfalls totaled 45 million rubles for production of rolling equipment, 27,900 units for tractors, 153 million rubles for chemical equipment and 24 million units for rolling-contact bearings.

In the area of scientific-technical activity, the machine building complex is doing a poor job in relation to many of the new equipment production goals. The scale and rate of supplying industry with fundamentally new types of machines and basic production procedures that would insure a multiple increase in labor productivity do not satisfy modern requirements.

Many types of new generations of equipment presently being designed to not yet fully correspond to the world level. Forty-two out of 137 articles tested in 1987, or almost one out of every three, are inferior to the best foreign models in relation to a number of the most important technical and economic indicators. In the Ministry of Electrical Equipment Industry, 8 of 16 tested types of equipment representing new generations do not satisfy the highest world accomplishments, while the USSR Ministry of Heavy, Power and Transport Machine Building the figure is 5 out of 13.

Medical x-ray equipment is significantly below the modern technical level in terms of diagnostic capabilities; equipment for the protection of the health of mothers and children is significantly behind as well.

Analysis shows that a number of the most modern articles will not attain the world level in 1988 either. Thus only 40.3 percent passenger cars, 25.3 percent of lift trucks, 2.6 percent of tractor engines, 19.5 percent of gas turbine installations, 20.9 percent of lead storage batteries, 21 percent of mobile power plants and 54.8 percent of computers will correspond to the world level.

Machine builders have been given the task of not only significantly increasing the production volume but also fundamentally reorganizing the processes of designing and producing machinery and equipment of world-class technology, reducing the time of development and completion of new generations of equipment by a factor of 3, and raising the capital-labor ratio of scientific workers, designers and process engineers by a factor of 2-2.5.

The effort to fulfill the prescribed quotas concerned with the technical level of machine building products and with renewing such products revealed a need for sharply expanding the extent of preparation of technical documents by means of computer-aided design, and increasing the testing and scale of unit-by-unit and integrated bench testing of new equipment. Today there are an average of 165 designers and process engineers for every automated work station, which attests to a low equipment availability.

The organization of scientific research and design work lags behind today's requirements, and the volume of new equipment projects and of capital investments into developing experimental bases must be higher than foreseen by the sectors for the immediate future. In machine building as a whole the proportion of capital investments for these purposes is increasing annually, and it exceeds the annual control quotas. At the same time over 50 percent of these installations are being erected behind schedule, and the level of unfinished construction is 136 percent.

Conversion of scientific research institutes and design offices to cost accounting and self-financing as of 1 January 1988 should change the attitude toward organizing scientific research and design work, it should concentrate efforts in the key directions of scientific-technical progress, and it should promote development of the scientific research and experimental base.

Consolidating the efforts of academy, VUZ and sector science, we need to unite the multimillion army of scientific-technical intelligentsia, inventors and efficiency experts—the members of scientific-technical societies. These societies can do a great deal to raise the creative return from scientists and engineers and from all enthusiastic champions of the scientific-technical revolution.

Initiation of series production of new types of equipment is being held back to a significant extent because deliveries of the latest types of supplementary articles and highly effective materials to machine building sectors are

not being met. Thus in 1987 the USSR Ministry of Ferrous Metallurgy delivered only 36 out of 84 new types of products subject to manufacture and delivery, the USSR Ministry of Chemical Industry delivered 17 out of 81, and the USSR Ministry of Petroleum Refining and Petrochemical Industry delivered 16 out of 33.

Resource conservation has not yet become one of the basic principles of socialist management in the work of machine building enterprises and associations. Many progressive production processes, and especially resource conserving ones, are being introduced unsatisfactorily. Production of precision blanks obtained by progressive methods is low. Their proportion within the total volume of blanks is 16 percent, while blanks obtained by part rolling methods created by Soviet scientists do not exceed 5 percent.

The proportion of forging-and-pressing machines, part rolling mills and other progressive technical resources that work metals by means of plastic deformation is 18 percent of the total pool of metalworking equipment, as opposed to 24 percent in the USA. This is retarding expansion of the use of deforming metalworking methods, including those based on superplasticity, isothermic stamping, high and impulse pressures, and others.

Roughing operations dominate in the structure of machine tools use associated with machining the main production's parts and units, their volume attaining around 60 percent. At the same time the proportion of ultrafine-finishing and finishing operations (diamond drilling, honing, grinding) is hardly increasing, presently being around 5 percent.

This is explained first of all by slow growth of the coefficient of use of ferrous and nonferrous metals. Thus in 1987 it was 0.73 for rolled ferrous metals as compared to 0.84 in the USA. This indicator is even lower in a number of machine building ministries. It is 0.65 in the USSR Ministry of Machine Tool and Tool Building Industry, 0.68 in the USSR Ministry of Electrical Equipment Industry and 0.69 in the USSR Ministry of Automotive Industry. The coefficient of use of rolled ferrous metals is low in relation to new types of products. For example it is 0.45 for the new T-25.01 tractor compared to 0.557 for the similar T-330 tractor; for the SZS-2.1L and SZS-2.1 seeding machines it is correspondingly 0.75 and 0.842. Such examples can also be cited in relation to other ministries.

Shortfalls in deliveries of economical types of metal products and nonmetallic materials and the inadequate level of use of progressive production procedures and equipment from precision shaping of blanks resulted in failure to meet the quota for economizing on rolled ferrous metals. Thus while the plan was to reduce their

consumption by 12.5 percent per million rubles of marketable products in the two years of the five-year plan, the actual figure was 10.9 percent, which is equivalent to overconsumption of more than 300,000 tons of rolled ferrous metals.

The machine building ministries found themselves unprepared to assimilate capital investments, the volume of which was increased over the previous years. A number of construction sites were not provided with the necessary designs and estimates, and equipment for pilot facilities was ordered and delivered late. As a result 1.8 billion rubles of capital investments, including over 400 million rubles of construction and installation work, was the shortfall in machine building as a whole in 1986-1987.

The targets of the five-year plan for 1986-1987 concerned with placing the most important productive capacities into operation were 70 percent fulfilled in regard to mainline electric locomotive production, 81 percent in regard to metal-cutting machine tools, and 35 percent in regard to production process monitoring and adjusting instruments.

In 1987 deliveries of machine building products for export were 92 percent of planned, while deliveries made for freely convertible currency were only 54 percent. Low competitiveness of a significant proportion of machine building products and the need for accelerated renewal of the country's production potential remain the causes holding back growth of machinery and equipment exports, especially for freely convertible currency. Expansion of exports to capitalist countries is being held back by the absence of systematic analysis of market demands. Adequate attention is not being devoted to advertising as an effective means of promoting the competitiveness of Soviet equipment and goods on the foreign market.

The CPSU Central Committee devotes constant attention to developing machine building. This is precisely why progress in fulfilling the program for modernizing Soviet machine building in light of decisions of the 27th party congress and the June (1987) CPSU Central Committee Plenum was examined on 24 July 1987 at a meeting of the CPSU Central Committee with the participation of Central Committee General Secretary M. S. Gorbachev.

It was emphasized at the meeting that no deviations from the planned program for developing the machine building complex would be tolerated. Machine building has been given the most important role in implementing the party's strategic course toward accelerating the country's economic and social development. The success of the five-year plan, of our most important initiatives and of fulfilling long-range plans depends on the machine building complex. The assistance needed by

this most important sphere of the national economy will continue to be rendered. It is the duty of all machine builders to respond in deed to the concern of the party and government.

The June (1987) CPSU Central Committee Plenum spelled out an extensive program of innovations at deeply reorganizing all aspects of our society's life, and approved basic principles of radical economic reform and control. New principles of structural, investment, scientific-technical and foreign economic policy were developed, and their implementation has begun. The orientation of current and long-range plans toward development of the social sphere and food production was intensified.

Planning was and continues to be the principal lever by which to achieve the party's strategy in organizing smooth operation of the powerful and complex organism that our national economy is. The state plan for 1988 was the first response to the progress being made in restructuring the entire planning system.

The plans place priority on developing Soviet machine building in accordance with the program of its modernization. It should be noted in this case that all progressive innovations of economic reform are being implemented on priority in machine building. As of 1 January 1988 all enterprises and sector science have been working on the basis of the principles full cost accounting and self-financing, the ministries have converted to a bilevel control system, and they were granted product export functions. Cooperation is expanding with foreign countries and especially with CEMA countries, and joint enterprises and scientific organizations are being created. Under the state acceptance system purposeful efforts are being made to renew equipment in production and to raise its technical level to the requirements of the world standards.

Association general directors, enterprise directors and organization managers have undergone certification in a number of ministries in regard to their mastery of the economic methods of control and in regard to their readiness to convert their enterprises to full cost accounting. The USSR Gosplan, the USSR Ministry of Finances, the USSR Gosbank and other ministries have taken steps to reduce the financial stress suffered by a number of enterprises in the machine building complex.

The process of progressive transformations is gathering strength, continually working its way into new spheres of social life. Democratization, glasnost and spiritual release have become the political basis for surmounting negative tendencies of the past, and for confirming high moral and ethical norms, the spirit of innovation, enthusiasm and a conscious attitude toward labor.

The plan for 1988 foresees further development of the machine building complex on priority. Production of industrial machine building products is to develop at a

preferential rate in comparison with industry (as 1.5 times the rate in industry). Within machine building, priority is laid on machine tool building, instrument making and electrical engineering.

Capital investments into production are to be 11 percent greater than in 1987. Over 50 percent of the total volume of capital investments are channeled into reequipment and reconstruction. All of this will make it possible to renew 11.8 percent of active fixed productive capital and insure a possibility for replacing 6.9 percent of worn and obsolete equipment in 1988.

In order to raise the scientific-technical level of machine building articles further, the plan for 1988 includes challenging targets for product renewal (9.1 percent) and for the proportion of the most important types of products corresponding to the highest world accomplishments (55 percent). The proportion of total production represented by progressive, high effective equipment (rotary and rotary-conveyor lines, numerically controlled flexible production modules, automatic and semiautomatic machines) should increase from 53 percent in 1987 to 63 percent in 1988.

The social orientation of the plan has been amplified. Significant assets are being allocated to construction of children's preschool institutions, palaces of culture, hospitals, athletic facilities and vocational-technical schools. The quotas of the machine building industries for consumer goods production were increased by 2.4 billion rubles over the target of the five-year plan. The volume of consumer goods production will grow by 12.7 percent over the 1987 plan.

Targets for rendering paid public services were set higher than the five-year plan. Subsidiary farms will enjoy further development. There are plans for increasing the volume of meat and dairy product sales in 1988 by a factor of 1.8-1.9 in comparison with 1986.

Significant assets (9 percent more than in 1987) are being allocated to development of the social sphere of machine building enterprises—a total of over 1.9 billion rubles.

Discussing the features of the 1988 plan, we need to dwell on the state order. The state order is a new planning category associated with full cost accounting and self-financing; it will ensure fulfillment of the priority objectives of the national economy, opening up real possibilities for expanding the independence of enterprises and economic methods of control.

The USSR Council of Ministers' state order represents around 60 percent of the total volume of industrial production by machine building enterprises. The state order included in the 1988 plan for the machine building complex contains 275 assignments for delivering the most important products (as compared to 1,588 assignments in the 1987 plan); as well as assignments for delivering the most important types of new products to

both the domestic and the foreign market—products based on developments of MNTK [not further identified], assignments of the CEMA KP NTP [not further identified] and state specific-purpose scientific-technical intersector programs. Thus in order to promote closer interaction of fundamental and applied sciences with production and to achieve extensive practical implementation of progressive scientific accomplishments, the state order was augmented by 40 assignments for delivering the most important types of new products reflecting developments of the Matallurgmash, Antikor, Nadezhnost Mashin, Robot, Nauchnyye Instrumenty, Tekhnologicheskkiye Lazery and IES imeni Ye. O. Patona MNTKs.

The quotas for producing marketable products were fulfilled by the machine building complex in the first quarter of 1988. However, fulfillment of the plan in relation to assortment of the most important types of products still remains unsatisfactory.

Implementation of new forms of cooperation with CEMA countries is acquiring special significance. I am referring to organizing direct productive and cooperative ties between enterprises, developing scientific-technical ties and forming joint enterprises and international associations—that is, converting to cooperation on the basis of integrated solution of the most important sector and intersector problems, ranging from scientific research and design concerned with creating new equipment, to organizing specialized and cooperative production of such equipment and its mutual deliveries.

The integrated program of scientific-technical progress of CEMA countries to the year 2000 is the backbone of this work. The plan foresees nine targets related to delivering the most important types of new products reflecting developments of the CEMA KP NTP concerned with introduction of electronics and full automation into the national economy, and to accelerating development of eight bioengineering processes. Fifteen targets are associated with implementing developments of state specific-purpose scientific-technical intersector programs.

As we know, the USSR State Planning Committee occupies an important place in implementing the party's strategic course toward accelerating the country's socio-economic development and carrying out the program to restructure economic control drawn up by the June (1987) CPSU Central Committee Plenum. The USSR Gosplan is called upon to fundamentally restructure its activities, to actively utilize the advantages of planned economic control, to raise the authority of the plan and to enhance its organizing role in attaining economic growth of a new quality and a new level of welfare of the Soviet people. Consistent implementation of economic control methods, improvement of the economic mechanism in full correspondence with provisions of the USSR Law on the State Enterprise (Association), improvement of the planning system and expansion of its democratic

foundation will become an important direction of the USSR Gosplan. The system by which state plans are written must be fundamentally altered, the effectiveness of centralized planning must be raised, and the limits of the economic independence of enterprises and organizations must be decisively expanded in accordance with the new conditions of their work on the basis of the principles of full cost accounting and self-financing.

To achieve an optimum combination of long-range and current planning, and to ensure its continuity, a transition will be made to development of a system of plans including the Basic Directions of the USSR's Economic and Social Development Over a 15-Year Period, with its indicators broken down into five-year periods, and in the first five-year plan into years, and the State Five-Year Plan, which quotas broken down into years.

The Conception of the USSR's Economic and Social Development Over a 15-Year Period is presently being written in order to successively incorporate the party's economic strategy into the plans and to determine the principal paths and means of its implementation. This conception will contain the set of the economy's priorities and goals, and it will determine the directions of structural and investment policy, scientific-technical progress, the goals of social development, and the tasks of raising educational and cultural potential and maintaining the country's defense capabilities.

The conception foresees maintaining priority development of machine building, and chiefly electronics and instrument making, and production of metalworking, electrical engineering, chemical and petrochemical equipment. In other words this period will be characterized chiefly by a high rate of development of science-intensive sectors that fundamentally affect the rate and proportions of development of the national economy and reduction of the material and energy content of national income.

Economic methods of controlling science and production that will affect the deepest roots of socialist production relations will enjoy further improvement. Automation and information science based on the latest accomplishments of microelectronics and effective production processes, atomic and thermal power engineering, optoelectronics, materials with standardized physicochemical and special properties, bioengineering and ecology will become the dominant areas of scientific-technical progress. These spheres are organically interrelated, and they reflect technology representing a transition from various sorts of external effects upon the object of labor to technological effects at the molecular and microstructural level. Progress in one field of knowledge will be accelerated many times over by progress in other areas of the society's scientific-technical activities.

The new stage of scientific-technical progress is unfolding in a time of deepening intensive socialist reproduction. And as a consequence the orientation is chiefly

upon the qualitative and not the quantitative aspects of the country's socioeconomic development. This is expressed in even greater expansion of the volumes of modernization and reconstruction of existing production operations, coupled with a transition to scientifically and technically regulated norms of energy and material consumption.

New criteria for evaluating the end results of scientific-technical and economic activity are assuming the forefront: quality and reliability; the degree and swiftness of satisfaction of both mass and specific demand; a high degree of mobility and flexibility of production in relation to changes external economic conditions; requirements concerning the ecological situation.

The investment process is acquiring new forms. The expensive and lengthy stage of scientific-technical development is being organically included within it hand in hand with a dramatic reduction the time to create fixed productive capital in natural and material form. Relative capital-intensiveness is decreasing, and investment policy is being oriented not on creating individual production operations but on satisfying major integrated demands, reconstructing and reequipping the nation economy and developing specialization.

Intensification of material production on the basis of wide use of automated systems, microelectronics, new materials and bioengineering is raising the effectiveness of many traditional production processes, affecting economic changes occurring in the sector and changing the nature of international cooperation. Export of scientific-technical information and scientific-technical services, the volume of which in the country's export-import balance should grow, has come into being and is quickly expanding.

The technical-economic level of the machine building complex will be determined by the output capacity and capabilities of its science-intensive sector, the proportion of which should increase by not less than a factor of 3-3.5 by the year 2005. The proportion of machine building products embodying science-intensive technical concepts will be increased to 70-80 percent, which will accelerate reequipping of the national economy's sectors and raise the effectiveness of social production.

Calculations show that wide use of automated systems and microelectronics in machine building will make it possible to raise labor productivity by a factor of 3-4, reduce product renewal time by a factor of 2-3 and insure a stable, positive output-capital ratio by the year 2005.

Progressive materials are to play the decisive role in reducing product cost and raising the national economic effectiveness of the machinery and equipment systems that are created. Use of amorphous materials just in distribution transformers alone reduced electric power losses by 60-75 percent, which could mean a total of 20-30 billion kW.hr in the country as whole.

Energy is the most important problem. On one hand there will be a transition to low-energy production processes in machine building, while on the other hand power production equipment of a new generation will be created, based chiefly on the use of alternative fuels and production of synthetic fuels.

The principles and equipment for forming water-coal mixture as a fuel for high-output locomotive diesel engines are being developed. Efforts to synthesize liquid fuel from crude hydrocarbons will be expanded, making it possible to introduce cheap raw materials into the country's fuel balance, including coal, peat and biomass.

Working in close coordination with scientists, machine builders must create a system of machinery and equipment by which to expand the country's energy potentials within this century. The future of microelectronics will basically be determined by the possibility for producing progressive materials satisfying the requirements of reliability and economic effectiveness.

Success will be determined by expansion of fundamental research and by creation of a powerful experimental base in machine building. The effectiveness and reliability of microelectronic systems are predetermined by the rate of assimilation of the latest accomplishments of quantum mechanics and solid-state physics.

There are also other highly important problems which machine builders will solve in the next 15 years. One thing is clear: Success of modern physical metallurgy and materials technology will be a key factor of the economy's development.

To solve the problems presented above, we need to raise the annual volume of outlays on scientific research, on design and on the experimental base to 22-24 percent of the total volume of allocated capital investments. The ratio of capital per scientific worker will increase by a factor of 10-12, chiefly due to saturation of the institutes, design organizations and enterprises with electronic, diagnostic and testing equipment. It is precisely in furnishing machine building production with science-intensive production equipment and control resources that a guarantee can be found for successful attainment of the objectives of fundamentally reequipping the sectors of the national economy and increasing the country's national income, posed before machine building.

The machine building complex has begun undergoing decisive restructuring. The priority tasks of fundamentally raising the technical level and quality of products have been posed. The strategy for long-range development has been defined. The adopted measures are called upon to ensure that a decisive contribution is made to switching the economy to the intensive path of development and raising the effectiveness of social production.

As was noted at the June (1986) CPSU Central Committee Plenum and a conference of the CPSU Central Committee (July 1987), no deviations from the plans and no objective or subjective excuses will be tolerated in carrying out the highly important state task of implementing the program to modernize machine building. Executive of machine building ministries, associations and enterprises, labor collectives, scientists and specialists must do everything necessary in short order, with full understanding and responsibility, in order to raise Soviet machine building to a leading position in the world.

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Coordination Between Price, Quality of New Technology Questioned

18230032 Moscow *EKONOMICHESKAYA GAZETA* in Russian No 17, Apr 88 p 19

[Article by V. Pinzenik, senior scientific associate of Lvov State University: "Equipment Price and Quality"; first paragraph is *EKONOMICHESKAYA GAZETA* introduction]

[Text] Do they always correspond to each other? The question is not an idle one, it merits fixed attention. After all, the price of new equipment in many ways affects the price system as a whole and determines the most important conditions of the cost accounting activity of enterprises and the social-economic development of the country.

As we know, certain practical steps have already been taken to establish a closer coordination between the price and quality of new equipment. The provisional "Methodology To Determine Wholesale Prices for the New Machine Building Output for Production-Technical Purposes" (EG No 51, 1987) has been approved. Widescale use in economic practice has been stipulated for contractual prices for a new, or first time developed, series production output, as well as for machines and equipment manufactured in accordance with one-time orders. Methods of reflecting the useful effect in the prices are being worked out, not only economic ones, but also social and ecological. These problems, however, in our opinion, are still being solved in a one-sided way.

An Old Base for a New Model

In order to eliminate expenditure price formation today, a new model study to calculate price lists for products designed to replace those developed earlier has been specified: the price of the new item is determined by multiplying the initial norm of the price (established per unit of the main parameter) by the quantitative value of this parameter. In this case, can one speak of the anti-expenditure nature of the new model of price calculation?

It would appear that the problem of anti-expenditure price formation does not lie in whether expenditures are to be the basis for the prices. Expenditures are present in the new methodology. For example, the norm of the price, which is determined for structurally similar groups of machine building output, calculated for the main technical parameter and to a great extent reflecting its consumer properties, is expenditure. Can this norm, however, be considered socially necessary if it is determined on the basis of the presently criticized expenditure prices? Is it permissible that the calculations incorporate expenditures to achieve a unit of the basic parameter for the base items, regardless of what it costs society to obtain this unit in newly created items?

Of course, granted certain assumptions, the price norms per unit of a certain consumer parameter can be regarded as socially necessary in the initial period of producing the new equipment, when its base model is predominant in production and operation. Even in this period, however, this approach is by no means always applicable. With the specified methodology of stability for the initial price norms, each appearance of new generations of equipment, let us say, doubling productivity, gives rise to a doubling of the prices themselves.

In addition, in time the "obsolescence" of the initial normative prices is inevitable. It is not appropriate to speak here about their conformity to the socially necessary level. The price formation methodology does not limit the periods of effect of the prices calculated according to consumer parameters. True, the possibility of using stepped prices is specified. It is not clear, however, at what time the second stage is introduced, what should be taken as its basis and if the initial price norm remains constant.

Unnecessary Restrictions

Today economic directors are in many ways interested in the answer to the following question: can the presently approved approach to establishing prices for equipment confer on them an anti-expenditure directivity? To answer it, we produced control figures for the prices of certain items of the agricultural, heavy machine building and motor vehicle industry, produced by the Lvov enterprises. The control figures were then compiled with the wholesale prices in effect. It turned out that the control figure prices were in many cases higher than the existing price lists.

For example, if in calculating the wholesale price of a Model 4081 lift-truck, only the basic user parameter is taken into consideration—the hourly productivity—then even without calculating the additional expenditures to change the other parameters it proves to be more than the going price. The present "anti-expenditure" model of price formation thus affords great scope for an increase in expenditures and is a unique cover for this increase. Calculations show that with this approach, in principle, the price can be extended to any expenditures

acceptable for the enterprise. There are quite a few methods of doing this, since there is a possibility of selecting this indicator to calculate the initial price norm that exerts the greatest influence on the price. There is also a certain possibility of maneuvering by selecting the base sample.

In our opinion, it is completely impermissible to exclude from the price calculations for new equipment models the expenditure for their production. "Expenditure" price formation comes not from the fact that expenditures form the basis for price formation (otherwise, it simply cannot be), but because any individual expenditures could first serve as this basis. We must take, not the path of abandoning calculating expenditures in general, but of accepting their socially necessary level as the price basis. This is the way we can determine the amount of expenditures being built up with the most up-to-date equipment, technology and methods of organizing production and labor. In order to stimulate the minimization of costs incorporated into the prices, it is expedient to take certain maximum limitations as the absolute size of the economic effect included in the price. Why have the increases in the prices stimulated an overstatement of the expenditures and artificial rise in price? Indeed, because they restricted by the limit amount (percent) to the prices. If highly efficient samples of the equipment are created, the amount of the addition has already begun to depend, not only on the effect, but also on the prices and expenditures.

The economic effect is determined not only by the extent to which the new equipment is best replaced, but also by how inexpensive it is. In this connection, there is some lack of clarity with respect to the second methodological formula, in which, when the useful effect of the new equipment is calculated, the price of the base item is corrected by using the adjusted coefficients (in a form comparable to the basic parameters of the new item) and is comparable with itself (not with the price of the new item). Is it really disadvantageous for society if the expenditures to produce new equipment are less than the price of the base item, and does this really fail to ensure an additional saving of national labor?

It would appear that this factor is subject to compulsory accounting when the economic effect is determined. If, in the price list is to be realized under all conditions, let us say, 50 percent of the economic effect, without any other restrictions, then understating costs for the producer becomes simply disadvantageous. Under the conditions described, a 1000 ruble reduction in the costs to manufacture new equipment will ensure a growth of profits, reflected in the price, amounting to 500 rubles. This is also advantageous for the consumer.

A Penalty Bonus

An interesting and extremely topical article by G. Khalidov, "Stimuli for Things in Progress" (EG No 52, 1987) correctly points out the present absence of efficient economic levers to arouse the enterprises to constantly update and improve their output. An essential

shortcoming in the existing incentive system for equipment quality is its use of incentives that are mainly connected with a rise in prices. For example, creating advantages for the producers of new equipment is mainly ensured by raising the prices, which lends a rising nature to the dynamics of the prices for machines and equipment, breaks the prices away from the cost and gives rise to commodity-money imbalance.

The weak stimulating role of the incentive markups was in many ways caused by the undeveloped state and insignificant scopes of using price penalty measures for the manufacture of obsolete products. A single acknowledgment of the need for relatively inexpensive, newly designed machines, equipment and instruments is insufficient. When new, highly efficient models appear, there must be obligatory, absolute price-lowering for those developed earlier. In other words, equipment progress in the last analysis should be accompanied by a general reduction in its price. This requires simultaneous carrying out of intercoordinated and coordinated calculations, not only of the raised prices for better items, but also of those reduced through obsolescence. At the same time, along with calculating the raised prices for the new, highly efficient equipment, in our opinion, there must be a determination of the dimensions and the output for which the prices should be reduced (establish discounts from the prices), which should stimulate replacement and updating of obsolete equipment.

The new methodology stipulates that the use of discounts from the prices be retained. The efficiency of this measure, however, depends not only on the scale of using the discounts, but also on the principles for establishing them. Right now the price discounts are used with respect to the product in the first quality category—five, ten and fifteen percent—and not certified in established periods—fifteen percent. Moreover, while previously, in transferring the product from the higher to the first quality, the incentive addition (in other words, the raised price) was first rescinded and then a discount was established, the discount is now established with an approved price list, which reflects the value of the economic effect from the production and use of the new equipment in the national economy. With respect to the items for which incentive additions were established earlier, the resolution of USSR Goskomtsen was subsequently included in the price list.

For example, for MPE-250 and MPE-400 manipulators produced by the Lvov Konveyer Production Association, increases in the amount of 2300 and 2200 rubles are included in the existing prices, which increased respectively to 9500 and 9700 rubles. We assume that in time these manipulators will be included in the first quality category instead of the higher. For the MPE-250 manipulator, even in the third year of operation of the first quality category, the maximum fifteen percent discount constitutes a total of 1425 rubles, which is considerably less than the 2300 ruble addition included in the price. In other words, before the enterprise is "fined," it

is first "encouraged" by a bonus, and moreover, in a considerably larger amount than the future fine. Under these conditions, however, a discount does not become an effective means of price penalty for the manufacturer of obsolete products and accelerating its updating process, since in this case the producers will be ensured of quite a high level of profitability.

Better and Inexpensive

It would appear that changes are also necessary in the mechanism of establishing and using price discounts. A discount from the prices should reflect obsolescence and economic damage to society from the production and use of obsolescent products, and should be determined by precise economic calculation. It cannot in principle be a unified, let us say, 15 percent in all cases. The discount must also be determined in consideration of how much worse the obsolete equipment is than the new equipment, and how much more expensive (cheaper) it is.

In our opinion, the period of using the newly approved higher prices should also be limited. Inclusion in the price list of the economic effect for an indeterminate period, as specified by the new methodology, is in no way justified. In this connection the use of incentive additions had an undoubted advantage—a limited period of effect.

One more thing. Prices for equipment should be made flexible. Here the economic incentive to stimulate the production of new, highly efficient goods should be implemented not only by a rise in the prices for it, but also by a reduction in prices for the obsolete equipment. Under the conditions of the conversion of machine building enterprises to full cost accounting and self-financing, the economic situation of enterprises and the wages of its workers will to a great extent depend on how quickly the product is updated, on the level of consumer properties of the newly developed equipment and on the expenditures required to achieve them. Production not only of better, but also of less expensive goods is becoming the reference point in economic activity.

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ROBOTICS

CEMA Cooperation in Robot Technology Described

18230038 Moscow *EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian* No 2, 198 pp 47-50

[Interview with Vladimir Stepanov, candidate of technical sciences, first deputy general director of the Robot MNTK [Inter-Sectorial Scientific and Technical Complex], deputy general director of ENIMS [Experimental Scientific-Production Association for Metalcutting Machine Tools], and chairman of the Council of Chief Designers of the Interrobot MNPO [International Scientific-Production Association; and Vitaliy Tsarenko, chairman of the board of Interrobot: "Robot, Interrobot, and Others"; date and place not given; first five paragraphs are *EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV* introduction; final

four paragraphs are editorial comment]

[Text] The history of science and technology does not contain many examples with such a fickle fate as that shown in the evolution of robots. Faith in these mechanical marvels was at first supported by science-fiction writers, then slowly withered, and still later found wings again. It is as if finally, only now, has a realistic approach to robot technology taken shape. Production of robots for the most diverse sectors is rapidly growing in the industrially developed countries. Moreover, half of them have a "technological" purpose: they are used for welding, painting surfaces, heat treatment, etc. Low-attendance technology, despite the relatively high cost of equipment, allows us to increase the intensification of equipment, as well as the efficiency and quality of labor.

Here too in the KP NYP [Comprehensive Program of Scientific and Technical Progress] for the CEMA member-countries the creation of a new generation of industrial robots is numbered among the leading trends in the field of production automation. It is intended to develop and produce for all sectors of the CEMA member-countries' economies industrial robots which measure up to the requirements of today and tomorrow. In the foreseeable future they will have added to them equipment with artificial intelligence which will be capable of receiving voice commands. Major problems will have to be solved by collective efforts with regard to developing and deploying basic research and applied technical projects.

And so, how is cooperation being tuned up in this field? What problems have been revealed? How closely have science and production been coordinated here? What is hampering successful implementation of the KP NTP's assignments?

We requested answers to these questions from the following competent specialists, persons who are taking part in the development of the mutual cooperation in the field of robot technology: Vladimir Stepanov, candidate of technical sciences, first deputy general director of the Robot MNTK [Inter-Sectorial Scientific and Technical Complex], deputy general director of ENIMS [Experimental Scientific-Production Association for Metal-Cutting Machine Tools], which is the pilot organization for carrying out the assignments of the KP NTP, and the chairman of the Council of Chief Designers of the Interrobot MNPO [International Scientific-Production Association]; and Vitaliy Tsarenko, chairman of the board of Interrobot, participating in which, as is known, are the PRB [People's Republic of Bulgaria], HPR [Hungarian People's Republic], Republic of Cuba, PBR [Polish People's Republic], USSR, and CSSR [Czechoslovak Socialist Republic].

[Answer] Vladimir Stepanov: The program of our international cooperation provides for the birth of a family of various types of robots—to be used in machining, assembling, welding, casting, and forging, in other words, where of the international division of labor in producing complete sets of parts and assemblies.

Naturally, we did not start from scratch. By that time the Robot MNPO was already operating within the framework of Soviet-Czechoslovak cooperation. And scientific and technical contacts in this field had evolved long before this. However, the creation of finished goods based on agreements and contracts was far from always being the ultimate goal of the mutual ties. The adoption of the KP NTP and the emergence of Interrobot have facilitated more profound cooperation in the planning and production of greater in-depth robot equipment, as well as strengthening direct cooperation between the enterprises and institutes of the CEMA member-countries.

A large and responsible role in developing and deploying cooperation, as well as in fine-tuning cooperation and specialization, is played by ENIMS. It not only performs the functions of a pilot organization and not only maintains close interrelationships with the joint performers of the projects, of which there are a great many, but also is in constant contact with Interrobot.

Now let's talk about the results which have been achieved. They have taken shape along two avenues of cooperation. In the first, whereby a certain country is assigned the task of planning a robot, and its partners can utilize the development when completed. In the second, whereby the countries participating in the cooperation create a range of industrial robots on an integrated design basis.

Let's say, for example, that Hungary is working on equipment for making monitoring measurements. Such robots by themselves, without human participation, register all the possible electrical parameters about which it is necessary to know during the course of assembly operations. At the same time, Bulgaria, the Soviet Union, and Czechoslovakia are taking part in creating a range of universal overhead and portal cranes, based on the unit-module principle. Here each of the partners has his own specialization. The ENIMS, for example, is responsible for manipulators with a hoisting capacity of 160 kg [kilograms]. The drives for them are being proposed by the Soviet specialists, while the control system is proposed by the Czechoslovak specialists. Each of the parties involved is developing the necessary technical equipment for this.

Poland has been assigned the task of producing universal robots for cold pressing and drop forging, as well as arc welding; Bulgaria has been given the task of turning out assembly robots with hoisting capacities of 5 and 10 kg and the technical equipment for them; while the Robot Soviet-Czechoslovak Association has been entrusted with producing robot units with a hoisting capacity of 20 kg.

[Question] Let's limit ourselves, however, to the examples which have been cited above, although our first interviewee was certainly prepared to continue his narrative. After all, dozens of organizations and enterprises,

bound together by a common idea, are cooperating. Let's talk briefly about who is coordinating and monitoring this multi-faceted activity and how it is being done.

[Answer] Vitaliy Tsarenko: First of all, I'd like to emphasize that Interrobot not only coordinates scientific and technical research, but also solves special problems of cooperation. After all, you know, it is conducted on the basis of the practical interests of several organizations and enterprises. The association assists in fine-tuning the direct links between specialists, whether it's a matter of research, creating an experimental model, or serial production of an item.

And this is bringing about specific, fruitful results. Some 40 agreements have already been concluded. One of them, for example—between the USSR UKRISIP [Ukrainian Scientific Research Institute for Machine Tools, Instruments, and Attachments] and the Bulgarian Beroe Combine—is devoted to creating a range of portal, unit-module robots with a hoisting capacity of 40 kg, as well as transportation-storage units.

In a number of cases it has proved feasible to form temporary collectives in order to effectively solve specific problems. We must assemble such collectives and provide them with everything they need, including finding a service area, installing drafting tables in them, preparing hotels for specialists, and also showing concern for the Interrobot staff members, of whom, to put it briefly, there are not too many.

Thus, for example, working together with engineers from Moscow last summer in Moscow within the walls of ENIMS were specialists from the city of Stara Zagora, where the Beroe Combine is located, and the city of Presov, where the Czechoslovak Vukov Concern and the Robot Soviet-Czechoslovak Association are situated. It must be said that meetings such as this one are of a businesslike and discussion-type nature. Because, after all, each of the participants bears not only his own, strictly personal experience, but also that of the country which he represents. All of us still have to learn how to listen to and understand each other. We must not allow the valuable ideas of some persons to be rejected because of the ambitions of other persons. We must be patient enough to welcome our partners' proposals and seek out ways to bring various points of view closer together.

And, of course, the effectiveness of such meetings depends upon the skills of the specialists. From this point of view, assembling the optimal composition of temporary collectives is helped by the contacts which Interrobot has established with its related scientific-production centers in the PRB, HPR, Republic of Cuba, PPR, USSR, and CSSR.

However, these contacts have not yet been fine-tuned to a sufficient degree. They do not allow us to fully achieve the desired result—a strict observance of the deadlines and a high-quality execution of the projects involved.

Both ENIMS, as the pilot organization working on this problem, and Interrobot are experiencing definite shortages of information regarding various aspects of the development of robot technology in the CEMA member-countries. There is no doubt that all the participants in our association are extremely interested in improving the system for providing information. This pertains to the state of affairs not only in the countries of the socialist community, but also those in the West. We must constantly study and know international business conditions with regard to robot technology; and we must have a good idea of its sales market. It is extremely important for all of us to have a complete and clear picture of where we can place orders both for the assembly of industrial robots. With this goal in mind, it is intended to set up within the Interrobot framework a bank of information regarding all questions of concern to the specialists.

Thus, practical experience makes changes in the MNPO's activity. In the Soviet Union an All-Union center for testing and certifying robots is being formed, based at the UKRISIP. Without certification documents, robots can neither be put into serial production nor sold.

[Question] The next question is connected with the mechanism for carrying out the assignments of the KP NTP. Replying here is the ENIMS representative again.

[Answer] Vladimir Stepanov: We are impatiently awaiting a new statute on the pilot organization. Under the conditions of the new economic-management system, with means concentrated in its hands, it will gain the right to flexibly solve problems of developing equipment and cooperation with the CEMA member-countries.

It is now perfectly clear that the pilot organizations must have more possibilities for effectively influencing the joint performers of the KP NTP's assignments. Up to now ENIMS, for example, has not had such reliable levers at its disposal. But, you know, even within our own country we have been unable to influence those ministries and departments which delay the creation of up-to-date robot equipment in the most important sectors. Isn't this the reason why the development and production of control systems which measure up to tomorrow's requirements have not been set up and fine-tuned to this very day? But, of course, without such control systems a robot is merely a collection of metal structural components. There is a constant shortage of even the basic sets of high-quality items such as, for example, electric motors.

In the Soviet Union alone 16 sectorial ministries and more than 40 enterprises, institutes, and organizations have become involved in carrying out the assignments of the KP NTP. The overall problem has been defined, but the conjunction of the various departments leaves much

to be desired. The existing system of financing also needs improvement: it provides neither science nor industry with the opportunity to react quickly to the customers' changing requirements.

Let's also touch upon the most difficult problem—price formation. Now, when the enterprises of the USSR have begun to work under the conditions of full cost accounting, this problem will probably become even more acute. It is a known fact that prices on industrial goods are higher in the fraternal countries than in the USSR. And so, when the time comes to circulate joint developments, the high cost of the cooperative-type shipments will conflict with the interests of the labor group. But even if compensation were to be found, it could happen that an expensive item might not find a market. That, in particular, is what happened when the Soviet-Czechoslovak Robot Association was transferred to a plant in the city of Makachevo (USSR) for the serial development of an industrial robot with a hoisting capacity of 20 kg: the price of the proposed control system is so high (and, accordingly, so is that of the robot), that it is still not at all clear who will be able to buy it—especially since these enterprises are operating on cost-accounting principles.

No less acute is the question of basic and applied research. As is known, many Soviet MNTK's bear the principal burden in carrying out the assignments of the KP NTP. But now imagine that they also convert to cost accounting. That would mean that all their links, including the foreign ones as well, would be keyed exclusively on current problems which are of interest to those enterprises or organizations which are members of it. And they would exist on the proceeds gained from introducing their own developments. However, the MNTK's principal task consists of organizing breakthroughs in the high-priority divisions of science and technology. And this, as a rule, is connected with major expenditures, which cannot be reimbursed on a short-term basis.

Take robot technology, for example. Development of this science-intensive sector is unthinkable without impressive budget allocations. What is required here, most likely, is the use of another system of financing, stable orders, for example. Otherwise, robot technology would not be able to advance very far, and quests for fundamentally new solutions would not develop. And, you know, it is only such quests which nowadays determine success in speeding up scientific and technical progress.

[Question] By way of illustrating this idea, the participants in our conversation cite the following example. Instead of the "wave" transmissions which have long been known in robot technology, the industrially developed countries of the West use cycloidal transmissions, which have proven their indisputable superiority. And here the following question arises: Which of the countries participating in Interrobot is prepared to invest

substantial sums in the development and serial production of cycloidal transmissions? After all, the PRB or the CSSR, for example, have mastered the output of mass-type transmissions, and the demand for them is guaranteed. Who then would undertake to create and manufacture expensive innovations?

In point of fact, the situation is not so simple as it might seem at first glance, all the more so in that it is clear to everybody that we need to develop and prepare to turn out a more improved design for transmissions. We must search for a way out of this impasse. The plan of the Robot MNTK (the pilot organization working on this problem) for 1988 has included the topic of developing cycloidal transmissions. At present it is difficult to say how, when, and where their production will be put into operation. But the fact that the imperfection of price formation is delaying the work is to be sensed at every step. The Moscow Krasnyy proletariy Association is working jointly with the Bulgarian Beroe Combine on creating two new robots. Calculations have shown that the cost of casting the frame parts at the Beroe is high and that this sharply raises the price of the finished item. It is intended to organize social production in Moscow, but at the Krasnyy proletariy they still cannot imagine who, under the conditions of self-financing, would buy such an expensive piece of equipment. But if the cost of casting were to be lowered, output would become unprofitable for the Bulgarian combine.

How should we proceed? Shouldn't we mark time while awaiting cardinal solutions?

[Answer] Vladimir Stepanov: Of course not. Not so long ago ENIMS was able to reach an agreement with the Czechoslovak Vukov Concern regarding the output of transducers having an up-to-date design. In return, the Soviet side obligated itself to constantly "feed" the Vukov with new transducer developments: as it were, a payment-in-kind for social production under the conditions of cooperation.

[Conclusion] In the case cited above a solution was found. But how many other examples there are where the problem of prices has advanced to the foreground, obscuring other, no less important economic, technical, organizational, and psychological questions of creating new, advanced-generation, industrial robots. It looks as if they cannot be coped with in an isolated way; they are interconnected and require aggregate measures, capable of using with the greatest effectiveness the collective labor of persons from various countries who are working closely together on the high-priority trends of scientific and technical progress.

[Editorial Comment] In 1972 the GDR and the PRB began to undertake cooperation in developing and turning out computer equipment on the basis of agreements reached in CEMA. These ties were carried out on a commercial basis. Their volume has constantly

increased. During the last three years alone the annual shipments from the associated enterprises from Bulgaria grew in cost terms from 50 million to 70 million rubles.

The new YeS-1057 computer manufactured by Robotron can serve as a vivid example of precise cooperation. On the basis of specialization and cooperation, Bulgaria produces storage devices in the form of removeable disks, which have been successfully used on computers made in the GDR.

Serial production has begun on the YeS-1057 computer, which can be widely used at large combines and in economic associations. It is capable of performing 1 million operations per second. In a system employing

two processors the speed of the action can be increased by a factor of 1.9. Another innovation is the YeS-7945 subsystem to this computer, with the aid of which it can be used for constructing graphs in design work.

The successful cooperation between the Robotron Combine and its Bulgarian partners will be expanded. Discussions are also taking place now about a joint entry in third-country markets and a broad-based exchange of software.

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2384

MOTOR VEHICLES, HIGHWAYS

Moscow Ring Road Safety Issues Highlighted *18290116 Moscow AVTOMOBILNYY TRANSPORT in Russian No 4, Apr 88 pp 20-21*

[Article by A. Rybin: "Problems With the Moscow Ring Road"]

[Text] Many drivers are familiar with the Moscow Ring Highway (MKAD). The 109-kilometer long highway girds the city, connecting all of the capital's radial routes with each other. The capability of traveling for a long time at a high speed without stops and with convenient grade-crossing elimination structures, good road information and facilities attracts many drivers. At the present time, two motels, three service centers, approximately 30 specially equipped roadside parking areas, more than a dozen filling stations, and several natural gas stations for filling vehicles that operate on natural gas fuel are located in the ring road zone.

Even in 1949, they were planning to build at a distance of 17-20 kilometers from Moscow's center a high-speed ring road that would insure rapid and safe transport communications between the city's rayons and relieve the capital's streets of through transport. Construction, however, only began in 1953. They cut the silk ribbon on the last road section in November 1962.

MKAD had rather high technical parameters for that time: The width of the travel portion was 14 meters (2x7); the median strip was four meters wide; there were four lanes; the width of one lane was 3.5 meters; the design speed for passenger cars was 120 kilometers per hour and 80 kilometers per hour for trucks.

During those years, MKAD was one of the best highways in the country. All grade-crossing elimination structures were built at different levels, the cement and concrete surface permitted heavy trucks to travel on it, and a special ribbed strip—an "alarm clock"—was built to warn drivers when they drifted from the travel portion to the side of the road. There were practically no limitations on movement—except one, cars had to travel in the left lane at a speed of 70 kilometers per hour or more.

The popularity of the ring road grew from year to year. Whereas traffic volume on the most heavily used section from the Ryzanskoye to the Kashirskoye highways was 1,500 units per hour during the first period of its operation, it had grown twofold by the end of the Sixties and exceeded the design capacity during this latter period.

At the same time, several miscalculations in the designing of the road began to appear: the width of the travel section was not sufficient for high-speed travel and there were tall border rocks near the median strip. This led to drivers preferring not to travel in the left lanes. They knew what a flying visit to the border when moving at

high speed could lead to. The absence of lighting had an especially unfavorable effect on traffic safety. The danger of being in a road accident during nighttime grew severalfold in comparison with daylight although traffic volume was 20-fold less during this time.

The shrubbery, which was planted on the median strip and which should have prevented blinding during the nighttime by the headlights of on-coming vehicles according to the project designer's plans, did not prove its value. The bushes only partly performed this function; in return, they concealed pedestrians crossing MKAD during the night.

By the beginning of the Seventies, the speed of the traffic flow was sharply reduced on a significant portion of the ring road because of the increase in traffic volume (to 40-50 kilometers per hour in some sections). The slow speeds lowered the productivity of transport work and this led to significant material losses. It became clear that these rates of growth in traffic volume were threatening to exhaust the road's carrying capacity rapidly.

The reconstruction of MKAD, which was begun in 1973, was to have corrected the situation. However, after the first section of the road between Entuziastov Highway and Volgogradskiy Boulevard with a length of 11 kilometers was finished four years later, further work was halted. It had turned out that reconstructing the road (expanding it by one lane in each direction) was no cheaper than building a new one. What should be done? The key to solving the transport problem of MKAD lay in the integrated development of the entire radial and ring structure of the capital's streets.

The main stress in improving highway traffic conditions was placed on organizational measures and the elimination of dangerous places on the road. Stationary GAI [State Motor Vehicle Inspectorate] points were set up every 10 kilometers and grade-crossing elimination structures were equipped with advance direction and distance signs. The following were prohibited: passing by trucks and traveling on bicycles. The parking of transport equipment was restricted on many sections (except in specially equipped areas), and the maximum speed was limited to 60 kilometers per hour. Several grade-crossing elimination structures were rebuilt into a complete "clover leaf". At the end of 1983, the second successive three-deck grade-crossing elimination structure appeared in Moscow at the intersection of three highways (MKAD, Varshavskoye Highway, and the new Moscow-Kharkov Highway).

The beginning of 1987 brought new changes in traffic conditions on the highway. "Truck travel prohibited" signs appeared in the left lanes of the highway instead of the "Passing by trucks prohibited" signs, and speed was increased to 80 kilometers per hour in the left lane from kilometer marker 1 to 11, 44 to 53, 57 to 74, and 95 to 103. All of the measures adopted have not completely solved the problem. The ever-growing volumes of motor vehicle shipments in the Moscow transport hub and the

failure to complete the radial and ring structure of the city have lead to travel on many sections of the Moscow ring road exceeding 60,000 units per hour during peak hours, i.e., as a matter of fact, it is transformed into a column.

Just as any other road, MKAD has a beginning and an end. We are talking about the kilometer readings which begin and end near the Entuziastov Highway. The kilometer markers, which have been set up, help drivers to find out where they are located or how far they have traveled on the ring road.

The 11-kilometer road section from Entuziastov Highway to Volgogradskiy Boulevard is the most well-built. Underground passages have been built here and the number of travel lanes in each direction has been increased to three as a result of the reconstruction that was carried out.

The segment between Kashirskoye Highway and Leninskiy Boulevard is perhaps the most dangerous section of MKAD. A driver must be especially attentive here. The pedestrian traffic from the large housing tracts of Yase-nevo and Teplyy Stan to the rest areas, which are located beyond the ring road, creates the preconditions for the occurrence of road and transport accidents. Another peculiarity of the road also exists: It passes through the Losinyy Island National Park and animals running across the road are no rarity in the section between Yaroslavskoye Highway and Abrampsevo.

Statistics show that road and transport accidents on MKAD are distributed in the following way: hitting pedestrians—50-55 percent; collisions of transport equipment—28-30 percent; hitting obstacles and stopped transport equipment—10-12 percent; and over-turning—5-6 percent.

October and May are the most dangerous months for traveling on the ring road. Road and transport accidents occur most frequently on Wednesday, Tuesday and Saturday from 1600 to 2000 hours. More than 40 percent of road and transport accidents occur during nighttime.

The owners of private transport equipment are involved in an accident most frequently—35 - 40 percent; the drivers of trucks—28-35 percent; of cars—20-25 percent; and of buses—5-10 percent. Although more than half of the vehicles in the traffic flow on the ring road do not have Moscow plates, Muscovites are frequently involved in accidents. Their share of them is 65 percent. Moscow Oblast drivers are more rarely involved in an accident—20 percent.

Among the main categories of participants in the road's traffic: drivers, pedestrians and passengers, the number of those injured in road and transport accidents is distributed approximately equally. The severity of the

consequences of road accidents on MKAD is high. Whereas the ratio of the number of accidents to those injured in minor accidents is 1:15 for the city, in general, it is 1:10 on the ring road.

The main reasons for road and transport accidents on MKAD are: excessive speed under dangerous conditions (20-25 percent), mistakes in maneuvering (15- 20 percent), failure to observe a safe distance (5-10 percent), and drunken driving (3-5 percent).

As you see, the statistics are still not comforting. The problems of the Moscow Ring Road await a solution.

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08802

RAIL SYSTEMS

Bank Official Evaluates Railroad Performance
18290117 Moscow GUDOK in Russian
17 May 88 pp 1-2

[Interview with Vladimir Nikanorovich Kopachkov, chief of the Promstroybank [Industrial Construction Bank] Administration for Organizing Credit and Financing Transport and Communications, by M. Kaganskiy; date and place not given; first five paragraphs are GUDOK introduction]

[Text] There is no small change in economics; in the final accounting, billions are made up from rubles. Every ruble spent wastefully becomes an obstacles on the path of reconstruction. The struggle for every possible type of savings is acquiring a vitally important significance.

The article entitled "How To Find a Billion", which was published on 8 March of this year in GUDOK, started a new permanent rubric. The material published under it will be a distinctive "bank of ideas" to which we hope everyone, who is not indifferent to the state of affairs in the branch, will contribute.

As is known, railroad workers have successfully fulfilled and overfulfilled the first quarter and the tasks of the four months. Tens of millions of rubles of above-plan profit have been received. However, is everything on the branch's financial horizon unclouded?

V. Kopachkov, the director of Promstroybank's Administration for Organizing Credit and Financing Transport and Communications, has replied to this question at the request of GUDOK's editors.

You can read the conversation with him on page 2.

[Question] Vladimir Nikanorovich, how do you evaluate the results of the railroad workers' activity, so to speak, through the prism of economics and finances?

[Answer] The results speak better than any words about this. A firm basis has been built for carrying out the tasks of the first year of working under the new management mechanism's conditions. The most comforting thing is that the directors of the lower subunits, planners, financial experts—yes, and even the ordinary railroad workers have begun to think in economic categories and to compare expenditures and results. The people's psychology has begun to change, a feeling of proprietorship has been awakened, and responsibility is being increased.

Nevertheless, this is far from occurring in everyone and everywhere. Here is only one fact: Nonproductive expenditures and losses for the branch as a whole exceeded half a billion rubles last year. Operating costs were also unjustifiably great. All of these are deductions from profit and, therefore, from the financial capabilities of the branch also.

[Question] You know, however, that it is planned to correct the situation and that a program for financially normalizing the branch is being developed. It is envisaged that a billion rubles of above-plan profit, including 600 million from reducing operating costs, will be earned.

[Answer] A billion is good, but let us compare: It is planned to "obtain" it during the five-year plan, and the branch will receive 1.6 billion rubles a year from the budget. Are these figures comparable? The envisaged total is not even the tip of the iceberg—only a portion of its top. They are only approaching genuine reserves stealthfully.

[Question] As they say, everything is visible from above to the financial experts. What untapped layers of reserves could you mention?

[Answer] Certainly. There are enormous reserves in capital construction. Matters are more or less favorable here at first glance. The plan for capital construction during 1987 was fulfilled by 99.8 percent. However, this is just the same as the average temperature in a hospital—normal. Because everyone indeed has it, it is yours. Let us look at the individual "temperature" of specific projects. A total of 100 of the 178 production construction projects with an estimated cost of more than four million rubles (the Ministry of Transport Construction is the general contractor) did not fulfill the plan for construction and installation work. The shortfall was 117 million rubles.

Under the new situation, one must build within norm timeframes, and that is why it is necessary to compensate for the shortfall during the next (i.e., the present) year.

[Question] This is good.

[Answer] As they say, good is good... However, they are building within the limits of contract work allocations, and capacities are not sufficient. They patched the holes

here; they appeared on other projects the same way. Only two production construction projects have been begun in 1988 instead of the normal two-three dozen. Approximately 50 have been temporarily shut down. In essence, a technical lag—and therefore, increased operating costs—has been programmed. In a word, the branch is cutting off the limb on which it is sitting.

[Question] Where then can additional forces and resources be obtained for all construction projects if, as you yourself say, there are not sufficient capacities and resources...?

[Answer] Where? Do not build unnecessary projects. There are not enough fingers to list them. One must build only that which provides a return rapidly. Naturally, this does not pertain to the social sphere. As they say, this is of primary importance in any event.

For example, the new 300-kilometer Pogromnoye-Pugachevsk Line was put into operation in 1981. A total of 300 million rubles was expended on it and it is practically not used and incurs large losses. The same situation exists with the Idzhevan-Razdan, Yevlakh-Belokany, Marabda-Akhalkalaki, and a whole number of other lines. You know, this represents hundreds of millions of rubles!

Many billions of rubles have been spent on constructing BAM. Losses during the five-year plan will exceed a billion. Here is the return from the assets invested!

And how do you like this: The Ministry of Transport Construction, in making use of its right to dictate, includes expenditures for the construction of its own construction industrial base in the estimate for each large project. The Ministry of Railways is led by this. Thus it was, for example, with the project for reinforcing the Chum-Labytnangi section. They failed to give the Pechora construction builders 8.6 million rubles for this although they had their own powerful base. The local railroad workers of the Sosnogorsk Division are not able to receive from their own ministry the assets required for constructing housing and projects for production purposes and expanding accessory facilities.

A similar situation has taken shape with the construction of the Berkakit- Tommot line and many other projects.

The Ministry of Railways is taking an inconsistent and unprincipled position, groundlessly allocating hundreds of millions of rubles to transport construction workers—and this using budget subsidies. Yes, it is also receiving another three billion in credits. It will pay annually 150 million rubles in interest for this. A staggering generosity amidst poverty!

There are similar "bricks" in the foundation of the branch's financial trouble—just count them. However, the railroad workers have not learned to consider them exactly as they should be—especially the employees on

the central staff. You see, the signature of a staff worker and even his oral command are worth a great deal—at times, tens of millions of rubles. It is necessary to think well ahead of time. However, it is no secret that they do not particularly think at times. The Ministry of Railways Collegium has talked about this and GUDOK has repeatedly written about it. Here is where there are large savings reserves! It is turning out that they have begun to save rubles at the local area but they are wasting millions in the central staff.

It is necessary to introduce order into the use of capital investments and to establish very strict control and material responsibility for the special purpose use of assets. This primarily pertains to the Economics Main Administration, Design and Capital Construction Main Administration, and railroad and ministry directors. If this is not done, we will not manage to solve the envisaged production and social tasks, technically re-equip transport, and increase traffic safety.

I have mentioned only a few of the large financial "deposits". And there are still many "minor" ones—in the tens and hundreds of thousands of rubles! For example genuine "memorials to bad management"—bronze sculptured groups—have been erected near the entrances to the Moscow subway stations of Konkovo and Teply Stan. They cost 175,000 rubles. With what glances will the subway workers, who have stood for years in line for housing, look at them?! Or has everyone been already supplied with an apartment?

[Question] Yes, there is something to think about here.

[Answer] Just a moment more. They have become accustomed to living in accordance with the principle: "I am rich, I do not count my money, and my property does not become less...." How could it become less? The railroad workers on the lines, who work strenuously and conscientiously, know this better than anyone but they are not able to solve their production and social problems—and not least because of "architectural" excesses. This is the truest waste of assets earned—without any exaggeration—subsequently by the blood of the many-thousand strong detachment of railroad workers. They work strenuously as, perhaps, no other branch.

[Question] During a recent collegium, the economic directors of lower subunits called the budget deduction norms, which had been established by the railroad and the ministry, exorbitant. Were they not connected with similar merchant-like generosity by other workers on the branch's staff?

[Answer] I think that they were connected in a very direct way. They often subsidize non-integrated, ineffective and uneconomical measures at the expense of profitable railroads and enterprise "donors" to the detriment of the latter's development. Today, all previous flaws have, so to speak, left the rails. Earlier, they practically did not engage in savings and did not consider expenses.

Now, the day of reckoning for disregarding economic work has arrived in the full sense. Only, unfortunately, work collectives must pay for it; the staff workers, who adopted—yes, and even now are still adopting—ineffective solutions, are not suffering in any material way. This is not permissible under the conditions of cost accounting.

Now, the question of whether there will be or not be a restructuring is a hard one. Self-financing is possible on the railroads. Scrupulous economic work, very strict financial discipline and strengthened material responsibility on the part of each official are required for this. Cost accounting is required at all stages of the management structure. On the steel mainlines, acceleration will depend a great deal on the work of the employees in the ministry's central staff. They dispose of the billions of rubles of assets earned by the railroad workers. This, however, is still not being done sufficiently effectively. The millions that are being lost are the specific price of the braking mechanism. The quicker that we begin to tear it down, the more rapidly will the branch move to new frontiers. There is no alternative to this.

08802

Minister Holds Press Conference

18290114a Moscow GUDOK in Russian 15 May 88 p 1

[Article by A. Kapkov: "Prescriptions for Cost Accounting Therapy: Notes From a Press Conference With N. S. Konarev, Minister of Railways"]

[Text] The railroads have been working under the new conditions for more than four months. There is already something to be happy about. For example, the first quarter shipping plan was completed three days ahead of schedule. The railroad workers have moved to a frontier which they had not taken even in the "best" of years. Approximately 1.14 billion tons were transported. A total of 48 million tons of them were above the plan.

This is on the one hand. Look, five years ago you would have indeed said that the starring hour of transport had arrived, that it is maintaining its rhythm and not deferring shipments to the emergency year's end, that the state order is being fulfilled in strict accordance with its product list, etc., etc.

All of these are good changes for the branch. It is possible to add also that quite a bit has been done here for self-support [samookupayemost]. An above-plan profit of more than 240 million rubles has been received. If this rate is maintained, the billion, which the branch needs for self-financing, will be earned in approximately one year.

Yes, that is true. However, you see, the "stepsons" of cost accounting still exist behind the general success figures. Approximately 300 unprofitable enterprises and one railroad that is still not operating fully—BAM—

hang like a heavy weight on the legs of progressive enterprises. The negligence of some is being covered at the expense of others. Why? Social justice requires, as the minister emphasized, that the question be solved. It is not fit to maintain dependents.

Possibly, it would be worthwhile to charge the builders' account for BAM. Despite the fact that the timeframe for building the Severomuyskiy tunnel has elapsed, they have still not commissioned it. It is as if the main line was torn in half. What to do? Distribute BAM to the strong roads bordering on it? Is it worthwhile?

It is a problem. And here is another one. According to the calculations of economists, the losses from non-productive expenditures on transport are approaching a billion rubles. A figure that makes one's head swim!

As before, it is also not clear how to correct the disappointing profitability of subways. To raise the fee for a trip or to make city authorities pay subsidies? The question is an open one and perhaps requires broad discussion.

These are the pluses and minuses. However, how should one help the collectives to get out of their debt captivity? What "tax" on negligence should be introduced in order to induce independence, enterprise and boldness? Different prescriptions have been proposed but there were no claims for their universality. On the contrary, the journalist were invited to look closely at the operation of the cost accounting therapy.

The press conference revealed the intentionally sharp questions of the journalists about the fact that, in the overall balance of successes and gaps, the control share holding has still not completely passed into enterprising hands. Why? The minister admitted that they had previously placed stress on income from freight and passenger shipments. Now, it is important to use other sources of income also—the production of consumer goods, services that are paid for, the expansion of services, etc. Here, railroad workers have practically done nothing.

There are still few examples of detached services, and the assortment selection of services has been reduced by half although there are lively examples of how the task should be done. The Moscow Railroad, which used a portion of its passenger cars for a hotel, has received 440,000 rubles of income and for the network as a whole—a million. Of course, the "wheeled service" occurred due to the lack of development of hotel facilities in cities. It is necessary to travel the path of constructing passenger complexes that include both hotels and a network of dining, consumer service, entertainment, and leisure enterprises.

This was the minister's answer to a question on the prospects for passenger service. The opportunities in this matter are still being used poorly and listlessly. The Riga railcar depot, where they were able to set up bars and video salons on wheels and sell sets of linens and other

goods, was held up as an example. Even cooperatives had involved themselves in services. Since the beginning of the year, they have earned 87,000 rubles of pure profit doing this.

What is preventing similar enterprise from being displayed on other railroads?

A journalist colleague told me in the lobby: "Yes, it is a sin for the railroad workers to complain about the absence of experience. Remember the history of NEP in transport". Indeed, the GUDOK political staff of that time was surprised that there were no cooperatives among the railroad workers then! They even talked about the fact that the whole area of consumer services should be transferred to cooperatives.

So it was. However, you see, no one is agitating today to search for similar opportunities. Commercial elements are still hardly being discerned in freight shipments. Leasing, contract prices, the providing of services to repair industrial enterprise sidings, the taking of products for storage—these and other cost accounting levers are still not operating as they should.

The system of the guaranteed supplying of enterprise with freight—the so-called "from wheels"—has been tested and has shown good results. Such an organization, which has received the resounding title "Rhythm", immediately acquired popularity among customers. And this is understandable: The guaranteeing of deliveries helps industrial enterprises to free themselves from stocks of material resources that are immobilized for months in warehouses.

A question was asked about the fate of the passenger high-speed right-of-way from Moscow to the Crimea and the Caucasus. The journalists expressed the fear that it might happen that they could expect the realization of this project only in the next century. The minister firmly assured them in answer to this that supertrains will ply the country during this century.

Research is now taking place on a future line and on its technical and economic characteristics. The State Committee for Science and Technology and the machine building ministries, which have to supply new rolling stock and other equipment, have been included in the task. The ministry has also opened up an account for voluntary payments for the new construction.

Having dwelt on the program for modernizing transport, the minister pointed out in particular that the Ministry of Railways has also introduced a proposal about the need to design not only passenger but also freight high-speed rights-of-way, which would link the European part of the country with the Far East. The strategy for developing transport aims at having cost accounting in all of its facilities rely on the latest achievements in equipment and technology.

What will the further fate of all of these plans and undertakings be? Many left this meeting with optimism and hope.

08802

Dispatching Center Begins Operation

18290114b Moscow GUDOK in Russian 15 May 88 p 2

[Article: "The Center Is in Communications"; first paragraph is GUDOK introduction]

[Text] A new railroad dispatching center for the automated control of shipments has begun operating in Tashkent. It is one of the largest and most modern centers in the network. What will the centralization of control provide to the railroad, and what problems have arisen during the shift to the new work methods? I. Reutov, chief engineer of the Central Asian railroad answers these questions.

A paradoxical situation took shape on the railroad during the last five-year plan: The technical level was no worse than on other mainlines but the return fell from year to year. Why did this occur? Practically none of the commanders were working for the future. They did not incorporate important innovations, and ideas had a difficult time. This is not surprising. They chased the plan, they patched up old holes, they looked "upward" all of the time, and they waited for instructions.

They did not decide to violate their subordination and to put forward any initiative. In a word, everything was normal just as for many others during that period. Where and for what should one strain? What if the technology for the operation of the classification yards be grandfather's, the repair of diesel locomotives and railcars be unsatisfactory, the condition of the track facilities be unimportant—not working well but reporting well is the main thing.

Naturally, there were also healthy forces on the main lines. They understood that it was impossible to work this way any longer. Here, restructuring stirred up initiative. They began to think and to search—yes, and not on petty matters but on important ones so as not to achieve a momentary success but to work for the future and to establish a reliable stockpile for the future.

The establishment of a common automated system for controlling shipments on the railroad also became the number one idea. This is a qualitatively new stage in organizing traffic. Now, each division dispatcher services a 100-150 kilometer section. The division has five-six loops and this means a great number of junctions. You know, however, that it is no secret that any junction is an obstacle. Division interests far from always coincide with the interests of the railroad and the network. That is why dispatchers, proceeding from their own benefit, at times do not send an empty car for disposition but use it to transport local freight.

The new control system has been called upon to eliminate this most painful bottleneck in organizing traffic. Its most important component is the Tashkent railroad dispatching center. The latest computer equipment has been set up here and with its help the center will be able to control movement on the territory of four divisions—Tashkent, Fergana, Bukhara, and Dushanbe.

A similar dispatching center is also being built in Chardzhou. It will consolidate the management of traffic in the Ashkhabad and Charzhou divisions. Parallel with these two centers, we are also building a railroad computer center. It will increase the centralization of control to an even higher degree and will insure an operational exchange of information about freight traffic not only with the neighboring Alma-Ata and West Kazakhstan railroads but also with the dispatching center of the Ministry of Railways administration.

The advantages of the new system are enormous. The use of computers will provide an operational, complete and accurate picture of transport work on the mainline in general and on each of its sections. We will be able to inform the client in advance about the approach of railcars. We will not only be able to fix but also to forecast railcar traffic and to control it. This will permit the movement of consists to be accelerated, losses and nonproductive expenditures to be lowered, and operating expenses to be reduced. The computer will free dispatchers from the collection and storage of movement information (it will go into an automatic cycle) and will permit them to engage in organizing work in the full sense of the word.

The adjustment of the equipment is now taking place in the Tashkent center. The division dispatchers are mastering control using electronics. Unfortunately, this process is not occurring as fast as we would like. Many commanders, especially those of the older generation, are getting accustomed to the computer with difficulty and are becoming flustered in the simplest of situations. They do not trust their electronic helpers—in a word, they are insufficiently prepared for working under the new conditions.

There are other difficulties also. The lack of development of peripheral devices is also hindering the mastery of the new system. There are only 100 information points on the railroad and many of them must work under automatic conditions. However, this has not happened. Technical office workers at small stations, after preparing consists and printing the information on a magnetic tape, transmit it not by computer channels but through the locomotive engineers—so to speak, through a "live" relay. As a result, only 80 percent of the data on formed and dispatched consists gets to the railroad computer.

Because of poor preparation, some dispatchers fear to use the expensive electronic equipment—and not without justification. It is not sufficiently reliable and it does

happen that it lets one down because the communications lines are not completely cabled and are not protected against interference. Sometimes, it is difficult to communicate with the railroad's computer.

We are trying to undo this "knot". We have developed and are already implementing a program for cabling all of our communication lines before 1991. We hope that this will become the basis for the dependable operation of the new system for automatically controlling traffic.

08802

Passenger Train Radio Communications Detailed
Moscow ZHELEZNODOROZHNIY TRANSPORT in Russian No 4, Apr 88 pp 55- 58

[Article by Yu. V. Vavanov, candidate of technical sciences; N. Kh. Dagayeva, engineer; and N. V. Kiselev, engineer: "Passenger Train Radio Communications"]

[Text] The up-to-date organization of passenger train traffic and the raising of its traffic safety and passenger service standards during a trip are inseparably connected with the widespread introduction of modern radio communications systems. Along with traditional types of train radio communications and in accordance with the new PTE [Technical Operating Rules] (par. 6.40), the engineers of train locomotives, which are equipped with UHF radios, must have communications with crossing duty attendants, repair work directors, signalmen, depot and station duty attendants on platforms, the assistant engineer when he leaves the locomotive cab, the chief of the passenger train, etc. Additionally, locomotives must be equipped with two portable UHF radios in accordance with par. 15.44; in the event that a locomotive is equipped with a two-band radio, one UHF radio in the locomotive is sufficient. A need to establish radio communications between the engineer and the train chief (brigade leader) and also between the dispatch duty attendant and the engineer and passenger train chief has been determined.

Besides the officially accepted types of radio communications, an important factor in improving passenger service is the use—in specially ear-marked zones—of radio communications between the train chief and the ticketing dispatcher in the division bureau for distributing and using seats on passenger trains (LBK) and of radio communications between the train chief and the ticket cashier and dispatch and terminal duty attendants during the boarding of passengers. The providing of an opportunity to notify hand luggage porters about the numbers of the cars where passengers need their help, is of interest. These tasks are being solved during the introduction of the radio facilities in the Transport Technological Radio Communications System.

Passenger Train Radio Nets

The Transport Railroad Technological Radio Communications System provides for the development of a set of equipment for establishing passenger train radio nets. In the first place, the installation of a RV-2 mobile radio, which operates in the VHF band (150 MHz) on one of six frequencies, in the train chief's compartment is provided for in passenger train radio nets (Fig 1). The main operating frequency (fE) serves to establish the train chief's radio net. The receiver, which is permanently on and operates in the listening watch mode, i.e., it is ready to take calls from subscribers on this frequency during the transmission of a signal modulated by the F=1000 Hz frequency, is also tuned to this frequency.

The RV-2 radio permits the train chief to establish radio communications with the locomotive train crew operating the train. In order to do this, he must switch the RV-2 radio to the train radio frequency (fD) by pressing the appropriate button and send the F=1000 Hz call sign. After this, the train chief engages in discussions with the locomotive engineer.

Such radio communications will be provided at all stages in the introduction of train radio communications. Thus, on locomotives equipped with only with ZhR-3M and ZhR-K-LP medium wave radios, the locomotive crew is equipped with two portable RN-2 radios with whose help radio communications are provided with the train chief. When the locomotives are equipped with ZhR-UK-LP radios, radio communications are carried out through the ZhR-U-LP VHF subset; and when equipped with modern radios—through the simplex part of the RV-1 radio.(1) This type of radio communications permits the train chief to transmit urgent information through the engineer or his assistant at any time no matter where the train is located when unforeseen circumstances arise. Moreover, the train chief has an opportunity to transmit information to the station duty attendant on this same frequency (fD) but using the F=1400 Hz call sign pulse when approaching a station.

In turn, the engineer can call the train chief when necessary by switching the radio to the fE frequency and transmit the necessary information on the work of the train crew or notify the passengers, including when there is a special situation on the train.

The radio also has the capability of entering into the train radio communications on the fT frequency. This can be necessary in large hubs where this frequency is used for isolating neighboring stations. In this case, the train chief will have a warning and he must press another button to enter into the PRS [train radio communications] network.

The RV-2 radio also insures operating on the fN frequency which is used for establishing communications between the dispatch duty attendant and the rail terminal duty attendants. When approaching the station and

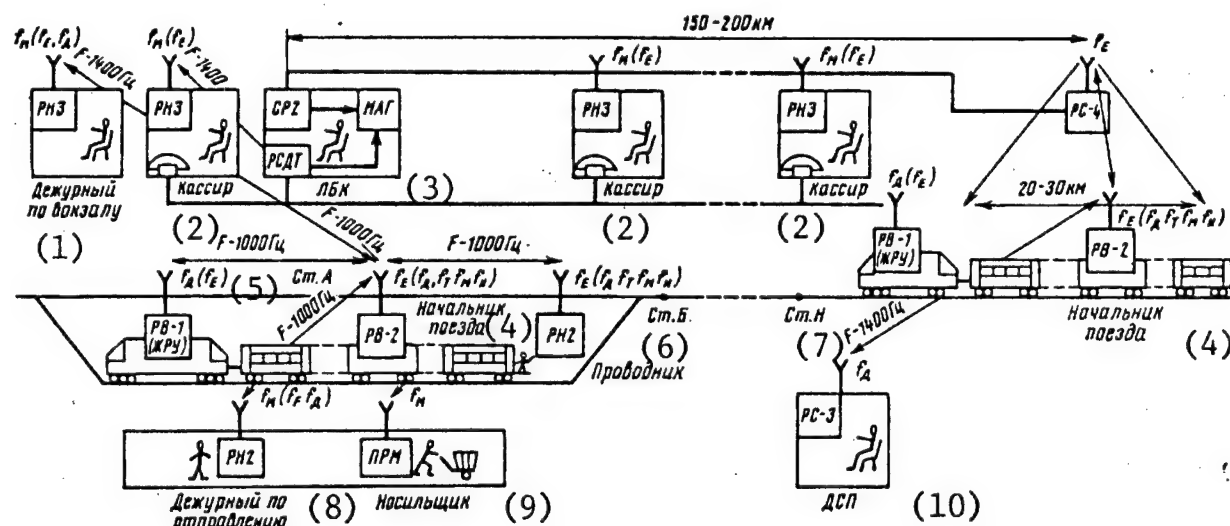


FIGURE 1

Key:

1. Terminal duty attendant
2. Cashier
3. LBK
4. Train chief
5. Station A
6. Station B
7. Station M
8. Dispatch attendant
9. Porter
10. DSP

while the train is halted at a station, the train chief has the capability of operationally transmitting to him information which is connected with the loading and unloading of passengers. Moreover, the train chief can notify luggage porters about the need for their assistance and indicate the specific numbers of the railcars while approaching the station—having assembled this information from conductors beforehand. While the train is stopped, the train chief can communicate with the ticket cashier and transmit to him information on restricting the sale of tickets when unforeseen difficulties arise. In order to do this, the terminal duty attendant and the ticket cashiers are equipped with RN-3 radios; the dispatch duty attendants—with RN-2 radios; and the porters—with PRM-N receivers. The weight of the portable receiver does not exceed 300 grams, it is placed in an upper pocket and is secured with a catch. All of these radios operate on the fM frequency. However, the dispatch duty attendants or the terminal duty attendants can switch over to the fE channel of the train chief or train locomotive engineer and transmit information on the boarding of passengers or other information connected with the servicing of passengers or the work of the train crew. In the event of a massive lagging behind of passengers, the dispatch duty attendant can delay the dispatching of the train by transmitting this information to the engineer. Moreover, the dispatch duty attendant can call porters to the required rail car when necessary.

During boarding, the train chief—having gone onto the platform and having taken with him and turned on the portable RN-2 radio—will have practically the same capabilities that he has when using the RV-2 radio: He will always find the dispatch duty attendant easily even when the platform is filled with passengers. In addition to the train chief, the conductors in the rear cars are equipped with the portable RN-2 radio. This insures continuous radio communications between the train chief and the rear car conductor both while stopped and when the train is moving. The portable RN-2 radio can also serve as an alternate for the portable RV-2 radio.

The timely transmission of information about the availability of empty seats on a train occupies an important place in servicing passengers. For this, the train chief has the capability in specially allocated zones to establish communications with the LBK and transmit the necessary information. These zones are set up at a distance of 150-200 kilometers from the location of the LBK or the section serviced by it. This permits the timely—1.5-2 hour—sale of tickets for empty seats in the approaching trains. An RS-4 radio is installed for establishing this radio net in the zone for transmitting information; and an SR-2 command station—in the LBK. As a rule, they are connected with each other by a four-conductor VF channel but the work can be done also using a two-conductor physical circuit including the one allocated for

the LBK. All transmissions are recorded verbatim. To do this, one can use, for example, the SHR-108 tape recorder which allows, along with the recording of the transmissions, the time of their conducting to be fixed and the time when they occurred during their playback (control listening) on a digital indicator.

The transmission zone does not exceed 20-30 kilometers and corresponds to 15- 20 minutes of train travel time. This is completely sufficient for transmitting information which—as research shows—takes no more than three minutes. The dynamic loudspeaker of the RV-2 radio gives short duration signals and a lamp lights up on its panel in order to attract the attention of the train chief when entering the “service zone”. An RS-4 radio transmits the “service zone” signals. In this regard, on sections with little activity where the movement rates of passenger trains are not great, these signals can be switched off from the SR-2 command station and switched on when a train is expected in the “zone”. When there is heavy traffic, the RS-4 radio transmits the “service zone” signals constantly and divides them for even and uneven bearings using modulating frequencies of 700-2100 Hz.

Having heard the “service zone” signal, the train chief presses the F=1400 Hz call button. Having received the call signal, the RS-4 radio is connected to the SR-2 through the wire channel and transmits the acknowledgment signal to the RV-2 radio. Having heard the acknowledgment signal, the train chief gives the number of the train and informs the LBK about his readiness to transmit information on the availability of empty seats. The LBK operator enters into radio communications with the train chief and records the transmitted information about the distribution of empty seats on the train by car. At the same time, the transmissions are automatically recorded with the help of a tape recorder device.

On sections not equipped with the Ekspress system, a tape recording device installed in the LBK can be switched on in order to control the requests of the ticket cashiers and their servicing in the ticketing and dispatching communications. The tape recorder is connected to an RSDT command station and insures the verbatim recording of all transmissions with the ticket cashiers and the fixing of their times.

In addition to the mentioned four frequencies, the RV-2 radio also has an fH frequency which can be used to establish radio nets of various designations, for example, in the parks for making up trains, to solve questions concerning the equipping of trains and their preparation for a trip; in individual large stations, for transmitting information on requests for taxis; etc.

Radio Communications for Notifying Local Passengers

Electric and diesel trains handle the largest amount of passengers in suburban zones. The maintenance and observance of their schedule depends greatly on the

timely transmission of information to passengers on the platforms concerning the destination and stopping places of the approaching trains.

At the present time, passengers receive information about the movement of local trains from a schedule on a board which is usually located near the premises of the ticket cashier. This leads to an unequal distribution of passengers on the platforms, their untimely receipt of information, and, as a consequence, increased time in boarding an electric train. When the train movement schedule is disrupted, the only information received by passengers is an announcement by the ticket cashier. In many cases, this is not efficient and leads to disorganized boarding of the electric train. As a result, the stops of the train are lengthened.

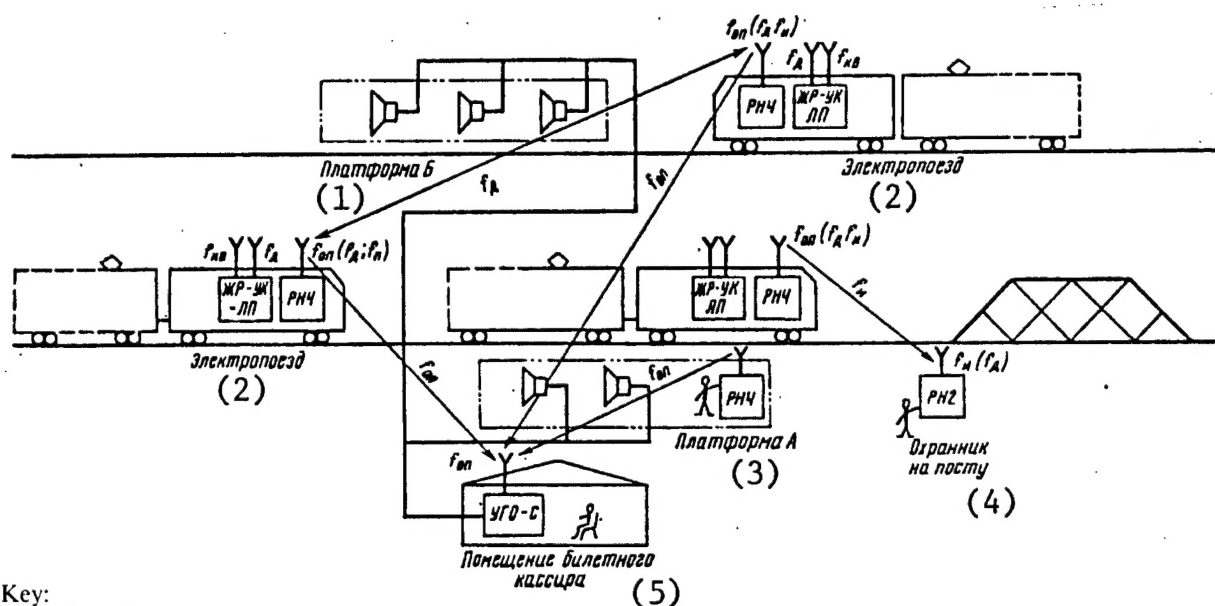
The servicing of local passengers can be improved by transmitting from the approaching train's cab information on its travel route and its stops. The notification system (Fig 2) contains stationary equipment which is located in the premises of the ticket cashier and which includes a UGO-S loudspeaker device with an RN-1 radio and portable equipment—an RN-4 radio issued to the crew servicing the electric train.

When a train approaches to within a distance of 300-400 meters from the platform, the assistant engineer using the RN-4 radio transmits information which is broadcast by loudspeakers mounted on the platform. In doing this, the loudspeaker notification of the passengers occurs in the following manner. The RN-4 radio, which is located on the electric or diesel train, radiates a high frequency signal on the fop frequency which is simultaneously modulated by a 2800 Hz frequency audio signal and by a speech communications signal. When the radio of the UGO-S loudspeaker notification device located on the premises of the ticketing cashier receives the signal, the power amplifier is switched on and the assistant engineer's message is broadcast through the external loudspeakers. After the transmission of the information stops, the UGO-S radio receiver switches back to the listening mode.

When two on-coming trains are approaching a station, the assistant engineer of the train located closer to the platform passes the information to the passengers first. In doing this, the assistant engineer of the second train will listen to what channel is busy through his radio because the RN-4 radio operates with an open channel. If the trains are approaching a platform simultaneously, priority for transmission time should be given to the assistant engineer on a definite avenue (it is established in advance).

While the train is stopped, the assistant engineer has the capability of making announcements about the closing of doors and the departure of the train while he is outside the cab on the platform. If the train is equipped with a UHF radio, the assistant engineer's having a portable radio also provides the capability to establish radio

FIGURE 2



Key:

1. Platform B
2. Electric train
3. Platform A
4. Guard at post
5. Premises of the ticket cashier

communications with the engineer, for example, in the event that the train is stopped or delayed because of a technical breakdown where the assistant engineer must go to the rear of the train. Equipping the crew with portable radios also permits radio telephone conversations with the crews of oncoming trains to be carried out on the train radio communications frequency f_D .

Procedure for Incorporating Passenger Radio Communications

The introduction of passenger train radio communications on the networks of the railroads is inseparably linked with their being equipped with RV-2 radios whose production is being organized in Ministry of Communications Equipment Industry enterprises. The design bureau of the Ministry of Railways Railcars Main Administration is doing the installation drawings.

The RV-2 radio is installed in the train chief's compartment and its AL-2 antenna—on the roof of the railcar. Power for the radio comes from a rail car 50 volt or 110 volt storage battery. The control panel (Fig 3) is mounted in a position that is handy for use. The panel has six buttons for changing channels (the three upper ones are covered by an MT-69 microtelephone). When a button is pressed, a number corresponding to the pressed button lights up on the display located in the lower left corner. When the main channel is not being used, the number blinks reminding one of the need to switch over to the main channel. Light-emitting diodes, which display the

receipt of a call "Call" or the setting of the radio to transmit "Transmit", are located here. The lower four buttons: "Call 1" - "Call 4", provide for calling on 700, 1000, 14000 and 2100 Hz frequencies (F) respectively. The radio's switch "Switch", the switch for "Receive" or "Listening watch" and the volume control are located to the lower right. In addition, there is a button for monitoring the radio's condition.

The radio has a switch for the frequency groups, using which the RV-2 operates on frequencies corresponding to the frequencies of the train radio communications (f_D) given to that dispatching circle. In turn and taking into consideration the fact that the f_E and f_M frequencies are common to all railroad nets, one can call the train chief even in a case where he is not plugged into the frequency group corresponding to that section.

The series of measures to equip trains with RV-2 radios will be carried out consecutively, beginning with the main passenger avenues. The opportunity exists to equip passenger trains on a wide basis with portable RN-2 radios (the train chief and the conductor of the rear car). In this case all of the types of radio communications described in this article will be provided with the exception of radio communications with the LBK.

At the present time, production capabilities do not limit the equipping of all subscribers with RN-2 and RN-3 radios, and that is why it is more advisable to carry out the introduction of passenger train radios in two stages.

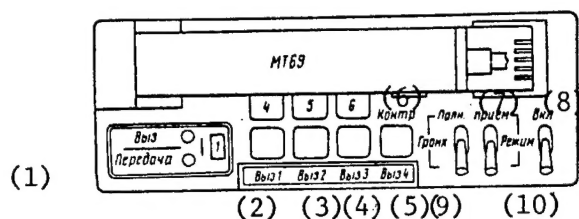


FIGURE 3

Key:

1. Call/transmit
2. Call 1
3. Call 2
4. Call 3
5. Call 4
6. Control
7. Full receive
8. Switch
9. Volume
10. Mode

During the first one, the widespread equipping of all of the main passenger-intensive avenues with RN-2 and RN-3 radios and the trains plying these avenues with RV-2 radios is envisaged; during the second one—the installation of RS-4 radios and SR-2 command stations in the LBK. When doing this, locomotives engaged in passenger traffic must be equipped with Zh-UK-LP or RV-1 radios first.

The designing of a telecontrol device for passenger trains based on the UTU-SP is planned for the future. This will permit the train chief to gather information on the availability of empty seats by car using keyboard dialing. When the train arrives in the "service zone" this information will be automatically read out, i.e., transmitted by the RV-2 radio through the RS-4 over the wire channel to the SR-2 command station installed in the LBK. With the help of a special interface, the information will be reformatted and printed out on a teletype and entered into a computer in those sections equipped with the Ekspress system. In doing this, the opportunity for conducting discussions between the train chief and the LPK operator is preserved in necessary cases.

In the first place, the introduction of the notification system will be more rationally carried out at stations with heavy passenger traffic. This will permit the standing time of the electric and diesel trains to be reduced. The stationary notification equipment which includes a UGO-S notification loudspeaker device, is placed in the premises of the ticket cashier. The device will contain amplifier and control units, a control panel, power and

amplifier units, a loudspeaker, and a radio. Using it, one can insure that the loudspeaker broadcasts the information transmitted from electric and diesel trains as well as that from the premises of the ticket cashier from the UGO-S control panel.

A stationary ASKI antenna (a product of the People's Republic of Bulgaria) or an AS-2/2 antenna is mounted on the roof of the ticket cashier's building. When it is located under a shed, the antenna is moved beyond its limits or is mounted on it. Uniform audibility on the passenger platforms is achieved by placing 10GR35 loudspeakers at a distance of 40-50 meters from each other. The loudspeakers can be attached to existing supports or to ones additionally installed.

RN-4 radios (RN-12B or 11R32N transceivers with PN-803 or MZ keyers) are used as the portable equipment which permits the electric and diesel train crew leader to transmit information to the passengers on the platforms. Storage batteries provide power for the radios.

The establishment of collective use radio nets with an outlet to the ZhATS [railroad automatic telephone exchange]. The establishment of RORS-T service operational radio communications, which will operate in the UHF meter band (330 MHz) under duplex conditions with individual signaling is envisaged in the Transport system for this purpose. A central RS-7 radio provides for simultaneous operation on four channels. Up to nine dispatchers can be plugged into it and it provides a capability for connecting to the ZhATS. Traveling subscribers are equipped with RV-8 radios which provide for an automatic search for a free channel, the calling of one of the nine dispatchers, entry into the ZhATS, and the calling of the required subscriber using a keyboard dialing. Not only the train chiefs and rail transport workers but also passengers in certain cases will be able to use the service operational radio communications. In the future, the RORS-T radio net will be expanded to a line one. It will become the prototype for constructing commercial telephone radio communications between train passengers and ATS [automatic telephone exchange] subscribers.

Footnote

1. Cf. ZHELEZNODOROZHNYI TRANSPORT, No 8, 1985

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